

JPRS-UEA-86-012

22 APRIL 1986

USSR Report

ECONOMIC AFFAIRS

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PLANNING AND PLAN IMPLEMENTATION

EXPERTS ADVOCATE PRELIMINARY PLANNING TO ENSURE PROGRESS

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 11, Nov 85 pp 15-31

[Article under rubric "Correspondence-Type Round Table Discussion": "Improving Preplanning Scientific Research"]

[Text] The economic substantiation of the national-economic plans largely depends upon the efficient development of preplanning scientific documents. The editorial office has asked a number of workers at scientific organizations and planning agencies, and the managers of departments, to express their opinions and recommendations concerning the role of preplanning documents and concerning the increase in the requirements made of them.

N. Lebedinskiy, deputy chairman, USSR Gosplan.

At the present time it is practically impossible to prepare a scientifically substantiated draft of a long-term plan without the preliminary working out of the fundamental economic and social questions, without a thorough study of the interrelated branch and territorial problems, the resolution of which largely determines the effectiveness of the functioning of the national economy.

For purposes of guaranteeing the comprehensive and effective development of the national-economic complex, as early as the stage of the preplanning study it is necessary to guarantee the combination of the branch and territorial aspects of planning, the carrying out of a single policy in the area of scientific-technical progress, capital investments, the development and placement of the productive forces, etc.

At the present time an entire system of preplanning documents is in effect. They include, first of all, the Comprehensive Program for Scientific-Technical Progress, which is developed every five years for a 20-year period, with a subdivision by five-year periods. In addition to the branch studies, which reflect the directions of development and the single policy in the area of NTP [scientific-technical progress], the materials in the regional section of the Comprehensive Program provide the opportunity to plan in a more substantiated manner the carrying out of the regional scientific-technical policy.

A special place among the preplanning documents belongs to the General Scheme for the Development and Placement of Productive Forces, which is developed for

a 15-year period with a consideration of the Comprehensive Program for Scientific-Technical Progress and such preplanning documents as the branch and territorial schemes for the development and placement of the productive forces. The latter are also prepared for a 15-year period. It should be noted that the decree of the CPSU Central Committee and the USSR Council of Ministers, dated 29 April 1984 and entitled "Improving the Planning, Organization, and Administration of Capital Construction," took a new step in increasing the role of the schemes as preplanning documents. That decree states, in particular, that the drawing up of the TEO [technical-economic substantiation] must be carried out only on the basis of the schemes, that is, if the scheme does not have a project, then the question of its designing, with rare exceptions, is resolved negatively.

The general scheme is becoming an increasingly important base material among the preplanning documents. They also include the General Scheme for Population Settlement, the schemes and drafts for rayon planning, the general plans for cities, and the territorial comprehensive schemes for the protection of the environment and the use of natural resources. All these documents also play an important role when determining the strategy of our country's economic and social development, and are closely interrelated with one another.

The work on these documents is carried out by special scientific organizations, but, judged on the basis of its scope, it noticeably yields to the labor-intensity of the Comprehensive Program for Scientific-Technical Progress, the General Scheme, and the branch and territorial schemes. I shall single out only the General Scheme for Population Settlement, which encompasses a 15-year period. Its development also takes a large amount of time, and special requirements are made of it. It must correspond to the long-term directions for the development and placement of productive forces and must guarantee the increase in the effectiveness of production in each region of the country. It is only if there is complete coordination between it and the General Scheme for the Development and Placement of Productive Forces that one can correctly define the paths for the development of major agglomerations, the creation of group systems of populated places, and the improvement of the system of rural settlement.

And, finally, it is necessary to dwell briefly on the comprehensive target programs, which are developed as an important component of the state long-term plans for economic and social development. They contain the resolution of the problems of assimilating new territories, the transformation of the economy of the regions that have formed, the formation and development of territorial-production complexes, problems of technical progress, and other questions. At the present time, in addition to the Food Program and Energy Program, these programs have been worked out for the development of the production of commodities and the services sphere, for the economic assimilation of the BAM [Baykal-Amur Mainline], and for various problems of science and technology. Work is being carried out to develop comprehensive key programs for the West Siberian TPK [territorial-production complex] and the Nonchernozem Zone of the RSFSR, for the elimination of manual labor, for the development of transportation, etc.

The work on all the indicated preplanning documents is coordinated by central state planning and directive agencies. This guarantees the intercoordination of the branch and territorial interests from the positions of the entire national-economic complex.

As early as the first years of the 12th Five-Year Plan, a new stage will begin in the work on preplanning documents. The main aspect that one should consider here is the achievement of their maximum continuity with the previously developed ones and the guaranteeing of the established deadlines for preparation. It is necessary to have closer coordination between the General Scheme and the branch and territorial schemes, on the one hand, and the Comprehensive Program for Scientific-Technical Progress, its regional aspects, on the other hand. It is also necessary to improve the work on organizational methodology. In particular, it is necessary to prepare a methodology for forming the territorial-production complexes and industrial centers.

At the present time the preparation of the organizational and scientific documents linked with the development of the schemes has been completed or is being completed. In particular, a coordination plan for their formation has been sent out to the coexecutors. The refinement of the methodological instructions has been concluded, and the development of the Concept for the Development and Placement of Productive Forces For the Period Until 2010 has been completed, and these documents have also been sent to the scheme developers.

The preparation of the Concept for the Period Until 2010 is an important scientific, methodological, and organizational measure. It will undoubtedly help the developers to become better oriented in the process of forming the schemes, inasmuch as they will know the strategy of developing and placing the productive forces for a more prolonged period as compared with the period for which the schemes are drawn up.

V. Kotelnikov, academician, Vice-President of the USSR Academy of Sciences.

A. Anchishkin, academician, director of the Institute of Economics and Forecasting of Scientific-Technical Progress, USSR Academy of Sciences.

An important role in the system of preplanning documents is assigned to the Comprehensive Program for Scientific-Technical Progress.

At the present time a large amount of work is being carried out to prepare the Basic Directions for Economic and Social Development for the forthcoming 12th Five-Year Plan and the long-term prospect. Special attention in this work has been assigned to problems of accelerating our country's socioeconomic development on the basis of scientific-technical progress. It is precisely those problems that were formulated as the key ones at the April 1985 Plenum of the CPSU Central Committee, and at the conference at the CPSU Central Committee on questions of accelerating the scientific-technical progress. An inseparable part of that vast job is the preparation of the Comprehensive Program for the Scientific-Technical Progress of the USSR in the Next 20 Years.

The Comprehensive Program for the Scientific-Technical Progress of the USSR contains, in addition to the scientific substantiation of the prospects for the scientific-technical and socioeconomic development, an analysis of the possible forms and methods of the most effective resolution of the strategic national-economic tasks and, correspondingly, the conclusions and recommendations for the preparation of the draft versions of the Basic Directions for the country's economic and social development for the long-term period, the five-year plans, and the long-term national-economic programs.

A very important task of the Comprehensive Program is the substantiation of the first-priority measures to be recommended for inclusion in the Basic Directions and the five-year plans for economic and social development; and the substantiation of the desirability of forming and developing the basic principles for long-term socioeconomic and scientific-technical programs, as well as a series of specific steps for the practical implementation of the recommendations contained in the Comprehensive Program. The computations and substantiations for the 15-year to 20-year period, and sometimes also for longer periods than that, are basically of a forecast nature, and for the next 5-10 years the Comprehensive Program is developed for a broad set of indicators, with a high degree of concentration and a consideration of the indicators in the Basic Directions for the Country's Economic and Social Development.

The experience of preparing the preliminary versions of the Comprehensive Program has confirmed the desirability of elaborating it in accordance with the following general directions (sections): the basic directions in the development of science; the basic directions for scientific-technical progress in the national economy; scientific-technical progress and the basic problems of the socioeconomic development of the USSR; regional problems of scientific-technical progress; world economics and scientific-technical progress; foreign economic and scientific-technical ties of the USSR.

One can isolate a number of general principles for developing the materials of the Comprehensive Program and the requirements pertaining to their content. For example, the most important principles include target orientation, which presupposes the formulation of the development goals, the attainment of which is the purpose both of the entire Comprehensive Program and its individual sections.

The coordinated nature of the directions for scientific, technical, economic, and social development presupposes, when developing the Comprehensive Program, the iterative intercoordination of two opposing approaches: from the expected results of the research and development, to changes of the technological scheme and characteristics of output, and to the technical-economic and then the socioeconomic indicators; from the social and economic indicators that characterize the goals and limitations of the long-term period, to the technical-economic indicators, necessary characteristics of the technological processes and output, and from them to the corresponding directions in scientific research.

The overall requirements whose implementation is supposed to guarantee the resolution of the tasks of the Comprehensive Program and the observance of the basic principles of its development as applicable to the specific directions include: the analytical evaluation of the base level of development of the specific sphere or branch of the national economy; the analysis of the tendencies that have formed in that development, with a consideration of the results of fulfillment of the corresponding national-economic plans and the implementation of the indicators and recommendations of the previous version of the Comprehensive Program; the comparative evaluation of the base and forecast quantitative and qualitative indicators for the specific directions of the scientific-technical and socioeconomic development with the corresponding indicators of the economically most highly developed countries; the clear-cut formulation of the most important tasks of the development being forecast; their resource support, priority status, and deadlines for resolution. It is necessary to take into more complete consideration the social consequences of the implementation of the measures.

The practice of working on the Comprehensive Program Until 2005, and the results of its consideration at USSR Gosplan and other agencies responsible for the administration of the national economy, have revealed a number of gaps in the corresponding developments, especially those that are of an interbranch nature. They were not all executed at a sufficiently efficient level, and all of their participants did not form their own necessary scientific potential for resolving research problems on such a considerable scale. In a number of instances, the results of the developments were influenced by the departmental approach, by the striving to relate the prospects of the branch development not so much with the qualitative improvement of its methods, as with the demands for increasing volumes of resources. At such time the influence exerted by their return on the decision of general economic and social problems, the acceleration of the dynamics of the corresponding indicators, was frequently viewed only in the most general form. Sometimes the factor that remained a weak spot was the realistic nature of the evaluations of various possible results of long-term development in its specific directions. In the research, insufficient use was made of the economic-mathematics apparatus, including models of intrabranch and balance-sheet settlements.

When beginning the new stage of the work, it will be necessary to consider and discuss questions of preparing the methodological materials for developing both the Comprehensive Program and the section concepts that take into consideration the results of the fulfillment of the national-economic plans during the 11th Five-Year Plan and the draft versions of the Basic Directions for the Economic and Social Development of the Country in 1986-1990 and For the Period Until 2000.

As early as the initial stages of the development of the Comprehensive Program Until 2010, one can see plainly the mobilizing role of the clear-cut landmarks that are contained in the materials of the April 1985 Plenum of the CPSU Central Committee and the conference on questions of accelerating the scientific-technical progress, and in the statements made by General Secretary of the CPSU Central Committee M. S. Gorbachev on questions of the party's economic and social policy.

It is also necessary to emphasize that the forthcoming work on the Comprehensive Program will be an important factor in mobilizing our country's scientific forces: science at the Academy of Sciences, in the institutions of higher learning, and in the branches.

V. Mozhin, academician, VASKhNIL [All-Union Academy of Agricultural Sciences]

In addition to the Comprehensive Program for Scientific-Technical Progress, the General Scheme and the branch and territorial schemes for the development and placement of the productive forces are an important stage in long-term planning. They serve as the scientific base for resolving the key questions of improving the territorial structure of the national economy, and thus for increasing its effectiveness.

The ministries and departments, the gosplans of the union republics, and their scientific and construction-planning organizations have carried out a large amount of work to draw up the schemes for the development and placement of the productive forces for the 12th Five-Year Plan and for the period until 2000.

Unlike the previous periods, these schemes were developed on a single methodological and organizational basis; they have encompassed a considerably greater group of branches of material production, the nonproduction sphere, and territorial units. More than 200 scientific-research and construction-planning organizations were involved in the work of preparing the schemes.

It is necessary to evaluate positively the fact that the materials in the schemes were widely used in the ministries, republics, and USSR Gosplan when preparing the Basic Directions for the Economic and Social Development of the Country for the 12th Five-Year Plan and Until 2000.

At the same time it must be noted that many ministries and republics submitted the schemes after the deadlines that had been established. The schemes were submitted with the greatest delay by the organizations of USSR Mintsvetmet [Ministry of Nonferrous Metallurgy], USSR Minugleprom [Ministry of the Coal Industry], USSR Minpribor [Ministry of Instrument Making, Automation Equipment, and Control Systems], and USSR Minpromstroymaterialov [Ministry of the Construction Materials Industry]. The preparation of the scheme for agriculture was especially drawn out.

But the chief complaints nevertheless should pertain to the quality of the materials being submitted. The materials in the schemes did not sufficiently reflect the resolution of the problems of accelerating the scientific-technical progress. In a number of schemes the corresponding section dealing with scientific-technical progress was prepared in the most general form, without any coordination with the technical-economic indicators for the enterprises. They failed to reveal sufficiently the reserves for reducing the materials-intensity, labor-intensity, and capital-intensity by means of the introduction of the achievements of scientific-technical progress.

There was insufficient development of alternate versions for the development of the branches, which are supposed to be based on substantial changes in

technology, technological schemes, and the organization of production. One cannot discern any course aimed at the acceleration of the technical re-equipping of the branches of the national economy. The percentage of new technological schemes is still low. Traditional technical and technological decisions prevail. Many schemes lacked any optimization computations. The sections dealing with economic effectiveness were poorly represented.

With this approach, naturally, one could see the tendency of the further extensive buildup of resources without any substantial improvement of the indicators of effectiveness.

One of the serious shortcomings of the development of the territorial schemes is the fact that in a number of schemes there is an unsatisfactory resolution of the questions of comprehensive economic and social development and no provision is made for changing the economy over to the intensive path.

A weak spot in the territorial schemes was the section pertaining to the intrarepublic placement of productive forces.

All this attests to the need to improve the quality of the materials to be included in the schemes.

When developing the schemes for the period until the year 2005 it is necessary to direct attention to the resolution of the following tasks:

-- the accelerated development of energy-intensive and fuel-intensive production entities in the eastern rayons, which have at their disposal the bulk of the fuel and energy resources; the sharp limitation of new construction in the rayons of the European zone, which have a shortage of fuel, water, and labor resources, and the carrying out there, for the most part, of remodeling and technical re-equipping of the existing enterprises; the achievement of a state of balance in every region between the number of work stations and the amount of manpower, between material production and the regional infrastructure (production and social); the development of recommendations pertaining to the comprehensive use of natural resources, and the preclusion of losses of mineral raw materials; the guaranteeing of the improvement of the population settlement in the regional aspect, the limitation of the growth of large and very large cities, the successive expansion of the economic base of the small and medium-sized cities; the resolution of the questions of protecting the environment, primarily by means of the development of technological schemes with little or no waste products; the stipulation of the broader involvement in production of the labor resources of the republics of Central Asia, Southern Kazakhstan, Azerbaijan, the development of the training of skilled cadres of workers from among the local youth.

V. Vorobyev, chief of the Department for Prospects of Economic and Social Development, member of the board of USSR Gosplan.

In recent years we have seen the formation and implementation in practice of a system for developing state plans which includes the development of the concept of the economic and social development for the long-term period, the

Basic Directions for the Economic and Social Development for the next five-year plan and for the more prolonged period (10 years), the five-year plan, and the annual plans.

Each of these stages has its own clearly expressed peculiarities both with regard to the duration of the planning period and with regard to the scope of the problems being considered, and the details with which they are studied. At the present time, for the Concept and the Basic Directions, the period chosen is the 15-year period with a subdivision into five-year periods, as being the optimal one. This period provides the opportunity to stipulate the resolution of major, fundamental tasks and at the same time to guarantee the necessary precision and substantiation of the scope of their resolution.

The fact that this system formed at specifically the present time is not accidental. The change in the role and influence upon the development of the economy, the resolution of the social tasks of the most important elements of expanded socialist reproduction, requires a very precise definition of the goals and tasks confronting society and the selection of those goals and tasks that have the highest priority, that are the most important ones.

The changeover of the national economy to the intensive path of development presupposes the qualitative reorganization of the structure of the economy. However, the reorganization of an already formed economy such as ours is a complicated matter that requires time, the concentration of efforts and funds, and the clear understanding of its consequences, because in the economy an error that has been made, the implementation of poorly thought-out decisions, as a rule, manifest themselves not immediately, and the cost of correcting them is great not only from the material and financial points of view, but also from the sociopolitical.

Therefore, the efficient preparation of scientific preplanning documents, which constitute in the final analysis the basis of the state five-year and annual plans, requires:

-- the thorough analysis of the achieved level of development of productive forces, and the level of resolution of the social tasks. People might say that this question is not a new one. But under present-day conditions it is becoming different from what it used to be. Under the conditions of the development of an economy with the predominance of the extensive factors of development, the basic emphasis in analysis, as a rule, was made on the quantitative changes. For example, the plan for the production of finished rolled metal was 100 million tons; if they produced 103 million tons, that was good, but if they produced 98 million tons, that was bad. Today, however, and in the long term even more so, the very fact of fulfillment of the plan in physical terms, in and of itself, does not say much. In satisfying the need, an increasingly important role, and in a number of instances the exclusive role, is played by the quality of the output being produced, its variety, reliability, and the labor productivity. If the plan for rolled metal was fulfilled at the expense of heavy items that were made from low-quality steel, but the plan was not fulfilled for the most effective types, the national economy does not win, but, rather, it loses. Therefore it is precisely the qualitative processes in the economy and in society that should be the areas

for concentrating the chief attention when analyzing the initial base of the period being planned. That, of course, does not mean that it is no longer necessary to analyze the quantitative evaluations in the economy;

-- the evaluation of the resources that the country will have at its disposal in the long run. We have in mind, primarily, the determination of the labor resources, the evaluation of the state of provision with raw-material, energy, and water resources. For our country the territorial placement of these resources is of tremendous importance.

The qualitative study of these indicators and their reliable evaluation play a tremendous role, since mistakes at the first stage will considerably lessen the value of the subsequent work. It is not just that time is lost. Mistakes that have been made can also require the reinterpretation of various fundamental principles included in the Concept.

In this work USSR Gosplan relies upon materials provided by USSR Academy of Sciences, its institutes, and USSR TsSU [Central Statistics Administration]. It is precisely the synthesis of the materials dealing with the evaluation of the initial base and the capabilities of the economy that makes it possible to determine the specific goals and tasks of developing the economy, the scale of the economy, and the level of resolution of the social tasks, and to select the specific paths for resolving them. Of course, when developing the Concept and the Basic Directions one also takes into consideration many other factors: the development of socialist integration, the analysis and evaluation of the development of international relations, etc.

In this regard I would like to note that the chief shortcoming of the Comprehensive Program for Scientific-Technical Progress is the dispersion of the scientific recommendations, the lack or poor selection of the most important directions, and insufficient ties with the real interests of the economy.

The preparation of the Concept provides the opportunity for USSR Gosplan to orient the scientific organizations toward the development and selection of the most vitally important directions and technical decisions that correspond to the fundamental interests of the long-term development of our country.

The choice of the scientific-technical problems guarantees the priority sequence of the most vitally important ones in the state plans and the placing of a firm material base under their development, and creates a reliable scientific foundation for the state plans.

V. Listov, USSR minister of the chemical industry.

The basic task of the scheme for the development and placement of the chemical industry is the determination of the optimal proportions for the development of its subbranches in the system of the national economy, and the guaranteeing of the further increase in the effectiveness of production on the basis of improving the territorial division of labor, the economically effective development and placement of chemical production in the union republics and economic regions, and the introduction of scientific-technical achievements.

The ministry has developed a Scheme for the Development and Placement of the Chemical Industry for the Period Until 2000. The present-day condition of the development of the branch is characterized by its concentration chiefly in the European part of the country, which at the present time produces approximately 88 percent of the commercial output of the branch and more than four-fifths of the synthetic resins and plastics, chemical fibers and threads, caustic and calcified soda, and synthetic detergents.

The scheme has planned a considerable increase in the volumes of production of chemical output in the rayons to the east of the Urals, which have at their disposal favorable conditions from the point of view of economic geography.

The scheme takes into consideration the tasks of the branch in resolving comprehensive national-economic programs: the Food Program, the Energy Program, and the program for the production of consumer goods.

The development of the scheme was based on the carrying out of optimization computations in various alternatives. A large amount of attention when developing it was devoted to studying the present-day state and the development prospects for the existing and the formation of new territorial-production complexes, industrial centers, and centers of the chemical industry. As has been demonstrated by experience, the group placement of enterprises reduces the construction cost, and there is also a reduction in the construction area by 9-10 percent, and the total length of the railroad sidings and intraplant tracks by 18-20 percent, and the engineering networks by 10-15 percent.

The formation of industrial centers should be carried out in close coordination with the development of the other branches, primarily petroleum refining and the petrochemical industry, and the mineral-fertilizers industry; as a result, the functioning of the center goes beyond the confines of a single branch.

In the past the process of formation and development of the centers lacked sufficient economic substantiation, and that led to the excessive concentration of the chemical industry in a number of places in the country (Dzerzhinsk, Volgograd, Sterlitamak, Novomoskovsk, etc.), and to the weak development of intrabranh and interbranch cooperative action and combinations, and thus to shipments of chemical freight for long distances. At the industrial centers there was an insufficient effective resolution of the questions pertaining to the centralized use of the projects intended for subsidiary and auxiliary purposes, the repair services, and the protection of the environment, and this has had an influence upon the effectiveness of the functioning of large-sized centers. All this is supposed to be resolved when developing the schemes for the period until the year 2005. A detrimental influence upon the effectiveness of the functioning of the industrial centers is also exerted by the lack of any clear-cut organization of the planning or administration of them. But that question requires special consideration. And I would like to make one additional small comment. Practice has shown us that the time has come to change the procedure of coordinating the placement of new production entities and enterprises.

The chemical industry delivers output that determines the technical progress in the key branches of the economy, and promotes the increase in the effectiveness of the national economy. Therefore, from our point of view, it would be desirable to have a situation in which the decision-making with regard to the placement of production entities is made the responsibility of the central planning agencies, and the local agencies are granted the right to resolve the questions of developing the social infrastructure, the projects for protection of the environment, etc.

M. Vasilyev, chief of the Chemical Industry Department, USSR Gosplan.

The qualitative development of the branch schemes largely depends upon the fulfillment of the requirements that are made of it by USSR Gosplan. How is this being implemented in the practical situation?

The chemical and petrochemical industry constitutes an intricate complex that consists of a large number of interrelated subbranches and production entities that are subordinate to various ministries and departments, and that produce more than 50,000 different types of output. The output differs substantially from the point of view of materials-intensity, energy-intensity, and labor-intensity. The chemical industry has varied and broad ties with other branches of the national economy that are the consumers of chemical output. This determines the complexity of the choice of the optimal scheme for the development and placement of the chemical production entities.

The development of long-range schemes for development and placement is complicated by a number of difficulties and shortcomings which must be taken into consideration when working on the schemes for the period until the year 2005. I would like to mention the basic ones: the existence of elements of a narrowly departmental approach to the placement of individual enterprises and production entities; the insufficient consideration of the influence that scientific-technical progress exerts upon the territorial placement of the chemical production entities and the formation of the production structure of the enterprises and complexes; the dependence of the placement of production upon the existing in the region of operating capacities of construction-and-installation organizations; the lack, on the part of individual territorial agencies, of any self-interest in the placement of chemical production entities, although this has been influenced by the national-economic need; the underestimation of the influence of the transportation factor in resolving the questions of placement; and the insufficient use of optimization computations when determining the territorial proportions for the development of the branch.

It is necessary to take into consideration the fact that, as a result of creating highly productive units, technological lines, and individual types of equipment that guarantee a substantial reduction in the labor-intensity of production, the chemical and petrochemical industry have all the prerequisites, in combination with the availability of the necessary and inexpensive raw-material and energy resources, for forming large-scale chemical complexes in the eastern parts of the country. However, in order to implement these measures it is necessary to guarantee the accelerated

development there of construction-and-installation organizations and the social infrastructure.

The development and broad introduction of energy- and water-saving technological process, and the requirements of increasing the effectiveness of production, also provide the opportunity for developing individual chemical production entities in the European part of the country by means of the technical re-equipping and remodeling of the existing enterprises.

When developing schemes for the period until 2005, it is necessary to guarantee the broader introduction of the methods of complete processing of raw materials on the basis of the creation of large-scale territorial complexes, and also to stipulate the centralized carrying out of optimization computations (by SOPS [Council for the Study of Productive Forces, GVTs [Main Computer Center] of USSR Gosplan]) for the leading complexes in the chemical industry on an interbranch basis.

I would like to express one more wish for the future. The availability of a close technological interrelationship in the development of the individual production entities in the chemical and petrochemical industry, the comprehensive nature of the raw materials to be processed, and the capabilities of obtained from raw materials of one type various kinds of output are factors that will influence the need for developing a single scheme for the development and placement of the chemical and petrochemical industry as an organically interrelated chemical complex.

This scheme must not represent a mechanical summing up of the ministerial schemes for placement, which sometimes contain elements of a departmental approach to the placement of production entities and to the formation of interbranch complexes.

N. Maslennikov, chairman of RSFSR Gosplan.

The speech by General Secretary of the CPSP Central Committee M. S. Gorbachev at the April 1985 Plenum of the CPSU Central Committee emphasized the importance of increasing the responsibility borne by the local agencies in administering the economic and social-cultural construction and the need to expand the rights of the local agencies and to intensify their initiative and self-interestedness in the development of production. Therefore the development of the schemes for the development and placement of the productive forces on the vast territory of the RSFSR is of fundamental importance.

The schemes that have been executed for the period until 2000 have defined the rates and proportions in the development of the national economy of the RSFSR, and the ways to raise the material and cultural standard of living of the population.

They have demonstrated the territorial shifts in the socioeconomic development of the RSFSR, have defined the problems of the economic and social development of individual zones, regions, and economic regions and the possible ways to resolve them, have given recommendations for improving the interrayon and interrepublic production-economy ties, and have developed territorial material

balance sheets for the most important types of output for the RSFSR and the economic regions.

The schemes have observed the fundamental principles involving the accelerated development of the eastern rayons, including the need for the economic assimilation of the BAM zone, the formation of territorial-production complexes, the limitation of the excessive development of large-scale cities and the socioeconomic development of small and medium-sized cities, the development of the Nonchernozem Zone of the RSFSR, etc.

Territorial schemes are an important instrument by means of which it is possible and necessary to carry out the combination of branch and territorial planning, that link at the preplanning stage in which one coordinates the interests and capabilities of the branch and the territory with a consideration of the specialization of the economic regions and the increased efficiency of the transportation ties.

The territorial schemes have been brought down to the levels of the ministries and departments of the RSFSR, the Councils of Ministers of the autonomous republics, the kray and oblast executive committees, and the Moscow and Leningrad city executive committee.

The territorial schemes were used, in addition to the Comprehensive Program for the Scientific-Technical Progress of the RSFSR in 1986-2005 and other preplanning documents, when developing the Basic Directions of the Economic and Social Development of the USSR in 1986-1990 and for the Period Until 2000. That was the first stage. The second, and basic, stage is the implementation of the principles of the territorial schemes in the draft version of the five-year plan for the republic's economic and social development in 1986-1990.

At the present time the departments of USSR Gosplan are preparing the development of the draft version of the plan for the economic and social development of the RSFSR for the 12th Five-Year Plan, widely using at such time the territorial schemes for determining the priority sequence and the paths for the development of individual territories, and for substantiating the remodeling and expansion of the existing enterprises and new construction.

The experience of working on the schemes until the year 2000 has revealed certain negative aspects in organizing the examination and coordination of the branch schemes, and this fact must be taken into consideration when beginning to work on the schemes until 2005.

Most of the ministries failed to submit to the Councils of Ministers of the autonomous republics or to the executive committees of the kray and oblast Soviets of People's Deputies the appropriate materials for the schemes with regard to the development of their enterprises on those territories. And although most of the republic ministries and departments submitted their schemes to the local Soviets for their findings, they could not be considered

with sufficient completeness in view of the lack of any connection with the schemes for the development of the union branches.

In order for the executive committees of the local Soviets of People's Deputies to be able to orient themselves precisely and to plan the prospects for the socioeconomic development of their territories, they must have at their disposal simultaneously the materials from all the branch schemes. That would make it possible for the executive committees to coordinate the plans of the ministries in the development of their enterprises on the territories that are subordinate to the executive committees with the labor, mineral and raw-materials, water, and other resources located on those territories, and to communicate to the appropriate ministry a substantiated finding with regard to the branch scheme. In order to carry out that work it is desirable to oblige the ministries and departments to submit the materials in the branch schemes to the local Soviets and within definite time limits.

V. Negrutsa, chief of the Department of Territorial Planning and the Placement of Productive Forces, member of the board of USSR Gosplan.

The requirements that are made of territorial schemes were expounded with sufficient detail in the refined Methodological Instructions for the Development of Schemes. However, certain principles deserve additional examination with a consideration of the experience of working on the schemes for the period until the year 2000.

When developing the territorial schemes, the basic task lies in ascertaining, analyzing, and evaluating the regional factors of the intensification of social production the use of which makes it possible to increase sharply the dynamic nature of the economic and social development of the country as a whole, and to guarantee the increase in the contribution made by each union republic and economic region to the nationwide production. These factors include, first of all, the problem of increasing the efficiency of the use of labor, energy, mineral and raw-material, and water resources, etc., the improvement of the territorial organization of the productive forces by means of the use of the progressive forms of their spatial organization (the placement and formation of territorial-production complexes, industrial centers, the construction of large-scale enterprises and their branches).

It is no accident that the weakest place in the territorial schemes currently is the section for the intrarepublic placement of the productive forces, within the confines of which one sees the manifestation, in the final analysis, of the degree of constructiveness of the accounting of the factors being considered with the purpose of achieving the maximum benefit for the national economy. In a number of territorial schemes this section was expounded, in essence, in an outline form and to a considerable degree is a statement of the principle that arises in the event of the simple totaling of the the branch studies. At the new stage of development of the schemes, it is necessary to avoid the passive nature of the forecasting of the intrarepublic

placement of the productive forces as a result of the mechanical compiling of the data in the branch schemes for the particular territory.

When beginning the new stage of the development of schemes, it is necessary to strive to intensify the economic specialization of the union republics and the major economic regions, and the more thorough study of the specific economic problems with a consideration of the regional specifics. By way of an example of the resolution of one of these problems one can cite the schemes that have been executed for the period until 2000 for the Baltic republics, where an intense balance sheet for labor resources has formed. The schemes contain sufficiently substantiated recommendations that are aimed at the acceleration of the remodeling and technical re-equipping of the existing enterprises which it is planned to carry out without increasing, or while decreasing, the number of employed persons, with the simultaneous increase in the coefficient of shift operation of the basic equipment. However, in certain schemes, such studies pertaining to the problems existing in the regions were not carried out.

Something that continues, with rare exceptions, to be a substantial shortcoming in the development of the territorial schemes is the low level of substantiation of the development of the territorial-production complexes and other interbranch formations. The lack of any specific recommendations is especially inadmissible for the territorial-production complexes whose development is the object of centralized planning.

It is especially necessary to emphasize that the projects to be included in the territorial schemes must necessarily be coordinated with the territorial economic specialization and with the comprehensive development of the republics and regions, and with the volumes of production and capital investments being planned.

The developers of the territorial schemes must not only raise the level of their work, but must also express in a completely definite manner their attitude to the optimization computations that have been included in the branch schemes and to the territorial balance sheets for the production and distribution of the most important types of output as being a very important element in those computations. It is necessary at such time to be guided by the procedure of developing the schemes for the period until 2005, which includes a list of the branches, subbranches, and individual types of output for which the optimization computations must be executed. And for the republics as a whole it is necessary to study in a more thorough manner the branch recommendations, and to strive in every region for the optimal combination of large-scale, medium-sized, and small enterprises.

It is also necessary to direct special attention to the limitation of the growth of large-scale and very large-scale cities. Quite frequently the developers accept the branch recommendations concerning the construction of projects in major cities without the proper critical analysis.

Work on organizational methodology requires improvement. Unfortunately, many lead developments do not devote the proper attention to this important sector. The territorial schemes are developed on the basis of methodological

instructions that have been prepared by the scheme developers, but not infrequently they are entirely based on standard methodological instructions, without the inclusion of any additional requirements or principles evolving from the specifics of the development of the productive forces of their region. As a result, in certain methodologies, and, consequently, later on in the territorial schemes, the proper attention is not devoted to the study of the important national-economic problems and an excessively large amount of space is assigned to the consideration of questions that are of secondary importance for the territorial schemes. The most widespread shortcoming of the territorial schemes is the inclusion of excessive details in them for purely branch indicators, with a small number of meaningful principles and recommendations pertaining to the economic development of the regions or to the formation of territorial-production complexes and industrial centers.

Among the organizational questions of developing the territorial schemes for the period until 2005, it is also necessary to mention the following one. The Councils of Ministers and the gosplans of the union republics, within the confines of their regions, carry out the coordination of the work performed by many dozens of coexecutors. For purposes of introducing order into this work in the union republics, it is desirable to adopt a document that establish the procedure and deadline for work on the schemes, which document is similar to the 14 November 1984 decree No. 268 of USSR Gosplan concerning the procedure for the development of the General Scheme and the branch and territorial schemes for the period until 2005.

D. Khodzhayev, deputy chief of the Housing and Municipal Economy Department, USSR Gosplan.

The period preceding the work on the draft of the Basic Directions of the Economic and Social Development of the USSR was marked by the development of a fundamentally new preplanning document -- the General Scheme for Population Settlement on the Territory of the USSR For the Period Until 2000, which was approved by a decision of the board of USSR Gosplan, dated 10 June 1984, simultaneously with the General Scheme for the Placement of Productive Forces.

The placement of productive forces and population settlement must be coordinated with one another to the maximum degree. However, it is obvious that people cannot be distributed among the cities, settlements, and villages, or plants, construction sites, sovkhozes, kolkhozes, and other locations in the way that we distribute financial and material resources. We see here the effect of specific social and, properly speaking, city-planning factors which have, indeed, influenced the need for the separate development of the General Scheme for Population Settlement. That scheme was all the more necessary in that, in the practical situation, one could see clearly revealed a number of shortcomings, difficulties, and contradictions in the development of inhabited places: the serious lagging behind in the rural areas from the housing and social-everyday living conditions and amenities in the cities; the disproportions in the development of major, small, and medium-sized cities and, finally, regional problems of population settlement: the lagging behind in the development of the network of populated places in the rayons of Siberia and the Far East, the hypertrophied growth of the cities in a number of rayons

in the European part of the USSR, the insufficient use of the labor potential of Central Asia, etc.

In the General Scheme for population settlement, urban and rural settlement are not separated from one another, but are viewed in a reciprocally coordinated manner. Provision is made for the changeover from the relatively autonomous development of individual settlements to the creation of settlement systems of various rankings, which, as a result, will be reduced to a single system for the population settlement of the USSR, corresponding to the country's single national-economic complex.

Let us consider the well-known problem of the limitation of the growth of major cities. We have done a rather large amount of work in this direction, and a number of the appropriate measures have been taken. USSR Gosplan and the Councils of Ministers of the union republics, and especially of the Ukraine, Belorussia, and the Baltic republics, have been persistently resolving these questions. Whereas in the 9th Five-Year Plan the average annual increase in the population in the 52 largest-sized cities in the USSR was 1,083,700 persons, including the mechanical influx of 719,300, in 1983 the figure was 745,300 persons, or 31 percent less, and the mechanical influx was halved, constituting 364,200 persons, and for the first time during all the years in the largest-sized cities it began to be less than the natural increase.

A good example of the resolution of this problem is the Scheme for the Development and Placement of the Productive Forces of Lithuanian SSR and the Basic Directions for population settlement on the territory of the republic for the period until 2000. Here the basic directions of the population settlement on the territory of the republic are closely coordinated with the placement of the productive forces on the basis of specific interrayon systems of populated places, and a long-range size of the population has been established for interrayon centers and other industrial cities in the republic for the period until 2000.

Nevertheless the measures being carried out to limit the growth of major cities would appear to be insufficient. Our country already has 22 cities with a population of a million, and 30 more cities with a population of half a million. The situation is complicated by the fact that many peculiarities of intensification objectively contribute to the growth of major cities. Many of the union ministries and departments attempt to place their enterprises there. Consequently, appeals and administrative measures are not enough. It is necessary to have socioeconomic measures, and to have a scientifically substantiated concept of the development of cities, a concept that would make it possible to combine the line aimed at the limitation of major cities with the maximum use of their scientific-production potential. That concept has been made part of the General Scheme for Population Settlement and it is planned to form, on the basis of major cities, group systems of populated places with the accelerated development of settlements in the outer zone of those systems.

The creation of group systems of populated places stipulated by the General Scheme of Population Settlement makes it possible gradually to resolve the

social problems more effectively with relatively fewer expenditures, by means of the creation within the confines of each system of a single production and social infrastructure, a single network of municipal and cultural-everyday services, recreation, construction industry, etc.

The General Scheme for Population Settlement, with the participation of the interested organizations, contains the development and coordination of the recommendations for resolving other important problems, in particular those pertaining to the social reorganization of the rural areas, the protection of the environment, the improvement of planning, landscaping, and the architectural appearance of the populated places, civil defense, etc. At the same time the scheme poses for the planning agencies a number of questions which have not yet been completely resolved. For example, the guaranteeing of the comprehensive nature of production and nonproduction construction. At the present time it would be desirable to develop production without an increase in the number of workers, but if that increase is planned, then it is necessary to carry out the nonproduction construction at outstripping rates, to ensure that we do not encounter a situation in which the production capacities stand idle because of the lack of personnel. It is necessary for the construction master lists for the production-type projects being newly begun, for which there is an increase in personnel, and the approved summaries of expenditures to stipulate the construction of housing and structures intended for social and everyday purposes, including assignments for the allocation of capital investments for the construction of those structures and their activation, and to carry out the financing of those construction projects in a comprehensive manner.

It is necessary to look for economic levers for regulating the population settlement. In the capitalist countries everything is determined by the price of the land. In major cities it is so fabulously high (for example, in the center of New York, from \$50 million to \$100 million per hectare) that companies are forced to seek other construction sites and this causes, as it were, a "self-regulation" of the population spread. Obviously it would be desirable to think a bit about the cost-accountability levers that are linked with the use of the land, water, heat, and removal of runoff, establishing preferential rates in the promising small and medium-sized cities and settlements.

At the present time, in conformity with the 24 December 1984 decree of USSR Gosplan and USSR Gosstroy, work has begun to draw up a General Scheme and a Regional Scheme for population settlement for the period until 2005. Those schemes will be developed in close coordination with the General Scheme and the regional schemes for the placement of productive forces in three stages: Concept; Basic Directions; and General Scheme proper. They will become an important preplanning document in the overall system of long-term planning.

B. Moskalenko, chief of the Combined Department for Social Problems and Population, USSR Gosplan.

The April 1985 Plenum of the CPSU Central Committee devoted attention to the need to put into action the social factors of increasing the effectiveness of social production.

The raising of the level of the scientific substantiation and social directedness of our plans makes higher and higher demands on the preplanning research and developments dealing with social questions. Their range is extremely broad. It is difficult to find a department in USSR Gosplan whose work, to a greater or lesser degree, is not linked with the resolution of social problem, the increase in the production of commodities for the public, the improvement of their quality, the construction of housing and structures intended for social and cultural purposes, and the providing of them with resources.

Hence the self-interestedness, essentially speaking, of all the subdivisions of USSR Gosplan in receiving thoroughly worked-out recommendations as early as the preliminary stage of working on the plan. This pertains first of all to the determination of the substantiated correlations among the various directions for raising the standard of living of Soviet citizens; the introduction of specific details, as applicable to the requirements of the state plan, pertaining to the concept "socialist way of life" and the ways to improve it; the development of commodities and services with a consideration of that socialist model of consumption; etc.

It must be said that in recent years the amount of assistance on the part of science for planning agencies engaged in social research has increased noticeably. For example, when preparing the draft of the Basic Directions for the Economic and Social Development of the USSR in the 12th Five-Year Plan and for the Period Until 2000, the departments of USSR Gosplan that are part of the Administration for the Comprehensive Planning of Social Development made wide use of the recommendations provided in the appropriate sections of the Comprehensive Program for Scientific-Technical Progress for the Period Until 2005, the developments that had been executed in developing its directions by NIEI [Scientific-Research Economics Institute], USSR Gosplan; Institute of Sociological Research and TsEMI [Central Economic-Mathematics Institutes, of USSR Academy of Sciences; NIItroda [Scientific Research Institute of Labor], USSR Goskomtrud [State Committee for Labor and Social Problems]; and other institutes.

At the same time the large potential capabilities of science with regard to social questions are by no means being used completely. It is no secret that the planning agencies are still not armed with sufficiently serious or profound research dealing with the questions of conducting an active demographic policy, or maintaining the economically and socially substantiated correlations between the increase in the expenses for labor and the receipts from the social consumption funds. A problem that requires more thorough study is the problem of the personal consumption structure that is most efficient for the individual stages of developed socialism, because it is precisely that structure that must be made the basis of the production plan, especially the average-term and long-term plan.

V. Anikeyev, chief of the Environmental Protection Department, USSR Gosplan.

When preparing the plan section dealing with the protection of the environment, use was made of practically all the preplanning documents. The

materials on environmental protection and the efficient use of natural resources which are contained in those documents contribute to increasing the substantiation of the planned assignments for environmental-protection measures. At the same time, the practice of using the preplanning documents has made it possible to locate in them a number of principles that require further improvement. The work is proceeding in this direction and definite results have already been obtained.

The Environmental Protection Department of USSR Gosplan has prepared recommendations aimed at introducing order into the content, increasing the purposefulness, and, most important, creating additional prerequisites for their effective implementation. The proposals were discussed at a session of the section of the Interdepartmental Council for Comprehensive Problems of Environmental Protection, under GKNT [State Committee for Science and Technology]. At GKNT, on the initiative of USSR Gosplan, a conference was conducted with the developers of methodologies for preparing the environmental-protection schemes, which conference assigned the task of taking into consideration the recommendations of USSR Gosplan for increasing the effectiveness of the use of the environmental-protection schemes when preparing the draft versions of plans.

An important condition for the successful application of preplanning materials is their precise coordination with one another. For that purpose, changes that stipulate various mutually supplementing environmental-protection questions in various schemes have been introduced into the Methodological Instructions for the Development of Schemes which have been approved by USSR Gosplan. Thus, in the environmental-protection schemes, the basic attention must be shown to the qualitative state of the environment and the comparison of it with the normative requirements. In the territorial schemes, with a consideration of the materials in the environmental-protection schemes, a determination for the party territory is made of the basic directions for protecting the environment and ensuring the efficient use of the natural resources, which, in their turn, must become the basis for the recommendations in the branch schemes for environmental-protection measures and the introduction of relatively wastefree technological processes and production entities at the enterprises in each branch.

In the General Scheme there is a determination of the basic directions for environmental-protection activity for the country as a whole, for the purpose of coordinating in this area the branch and territorial interests.

However, the developed schemes and comprehensive scientific-technical programs frequently do not meet the requirements of environmental protection. Their use for preparing the draft versions of the plans is frequently impossible, and this must be taken into consideration when working on the schemes for the period until 2005.

P. Semenov, deputy chief of the Department for Territorial Planning and the Placement of Production Forces, USSR Gosplan.

The preparation of the branch and territorial schemes and especially the General Scheme for the development and placement of productive forces for the

period until 2000 was carried out at a higher level than for the periods until 1980 and 1990. The lead developer -- SOPS, attached to USSR Gosplan -- included new structural decisions in the content of the General Scheme. Judged on the basis of its qualitative level, the scheme now conforms more to the requirements that are made of it. The General Scheme for the development and placement of productive forces was examined and approved by the board of USSR Gosplan, and the recommendations contained in it were widely used when preparing the draft version of the Basic Directions for the Economic and Social Development of the USSR in 1986-1990 and for the Period Until 2000. However, taking into consideration the special importance of the General Scheme, it will be necessary to continue to improve the technological scheme, forms, and methods of preparing it. Therefore, for purposes of the further raising of the level of work on the schemes, I would like to present several proposals for discussion.

One of the most important and most complicated tasks of developing scientific preplanning documents, and primarily schemes for the development and placement of productive forces, is the search for and the complete substantiation of the optimal coordination between branch and territorial development. When drawing up draft versions of plans and especially when implementing them, it is precisely here that a large number of questions that are difficult to resolve arise. It frequently happens that recommendations that are economically desirable from the point of view of the ministries and departments prove to be unacceptable or have substantial remarks made by local territorial agencies, and vice versa. The difficulties of resolving such questions are considerably influenced by the fact that many of them prove to be insufficiently thought-out at the preplanning stage. Unfortunately, there has not yet any success in resolving this task in full volume in the schemes for development and placement of productive forces for the period until 2000.

One of the reasons for this situation is the failure to observe the technological processes and time limits for developing the branch and territorial schemes (tardy and incomplete exchange of materials among the developers of the branch and territorial schemes; nonfulfillment by them of a number of requirements in the methodological instructions; etc.). However, there are also other reasons that are even deeper. As is well known, when the General Scheme is being developed, three interrelated types of material are prepared: the Concept for the Development and Placement of the Productive Forces; the Basic Principles Governing the General Scheme; and the General Scheme proper. These documents are very important landmarks and guides for keeping the development of the large number of branch and territorial schemes moving along the single national-economic track. Of course, material that is especially valuable in this respect for the developers of the branch and territorial schemes is the completed general scheme. But by the moment that the preparation of this document is completed, the branch and territorial schemes, for the most part, have already been developed. It would seem that in this situation it is necessary to bring closer together the final deadlines for the development of the General Scheme also. But that is undesirable, since the ministries, departments, and local territorial agencies, with regard to many fundamental questions pertaining to the development and placement of productive forces, by that time cannot yet define their positions. In this connection, two documents that take on special importance are: the Concept and

especially the General Principles for the General Scheme, inasmuch as the preparation of the latter is carried out with a consideration of the preliminary developments of the ministries, departments, and local agencies, which were executed on the basis of the parameters assigned by the Concept for the development of the national economy. The Basic Principles, factually speaking, are the chief initial base for the developers of the branch and territorial schemes when they are making computations and defining their positions with regard to questions of intercoordinated branch and territorial development. It is precisely for this reason that the procedure for developing the schemes, as approved by USSR Gosplan, has established that the consideration of the Basic Principles of the General Scheme at USSR Gosplan is carried out approximately a year prior to the approval of the branch and territorial schemes. However, from our point of view, that document does not yet properly correspond to the requirements made of it by the methodological instructions dealing with the development of schemes, and does not fulfill in complete volume the function that has been assigned to it. The Basic Principles of the General Scheme are developed in too generalized a manner: they do not have enough specific indicators for the development and placement of the branches, which have been coordinated with the parameters for the development of the union republics and the major economic regions. The Basic Principles must contain a system of indicators that makes it possible, after they have been considered at USSR Gosplan, to orient the planners of the branch and territorial schemes toward the parameters for development of the branches (in their territorial cross-section) and economy of the union republics which were proposed by the lead developer and accepted by USSR Gosplan. With this posing of the question, the executors of the branch and territorial schemes will be able in a purposeful manner, in coordination with the parameters for the development of the entire national economy, to refine those documents, and the customers will be able to approve them.

The second question on which I would like to dwell briefly is the content of the General Scheme. Here it is necessary to bring into the forefront the research on the basis of balance-sheet methods of interbranch and interrayon problems, that is, those problems that cannot and should not be the object of consideration in the branch and territorial schemes. In the General Scheme it is important on a single methodological basis to provide the economic substantiation for the effectiveness of the most important structural branch and territorial shifts in the national economy in the long-term view.

An important place when developing the schemes until 2005 must be given to the preparation by the USSR ministries and departments of territorial balance sheets for the production and distribution of the most important types of output, and to the carrying out of optimization computations. It is only with the availability of these materials and the working out of one's attitude toward them in the union republics that one can talk about raising the level of the scientific substantiation of the questions being resolved in the schemes.

Unlike the previous cycle of development of schemes, more time is currently being assigned to the work on the branch and territorial schemes at various stages of their preparation. It must be especially emphasized that provision is made for a necessary time lag for submitting the schemes dealing with

transportation, construction, the interbranch production entities, and certain others with respect to all schemes, which was not properly taken into consideration when developing the schemes until 2000.

An important factor for raising the level of the preplanning developments is strict supervision of the use of the financial resources which are being allocated for specific purposes and which, at the present time, are not being completely used for the immediate purpose for which they were intended.

In the materials of the October 1985 Plenum of the CPSU Central Committee, special emphasis was made of the importance and complexity of developing a scientifically substantiated prospect for the development of the economy on such gigantic scales as ours. It was mentioned that in the forthcoming 15 years it is planned to create an economic potential that is approximately equal to that which has been accumulated during all the previous years of the Soviet authority, to carry out a structural reorganization of the economy, and to resolve the exceptionally important economic and social tasks. All this places a large amount of responsibility on the scientific collectives at the institutes of the USSR Academy of Sciences, the USSR Gosplan system, and the ministries and departments which are employed in developing the questions of our country's long-term development. It is necessary to assure that at all the stages of carrying out this work there is a continuous deepening of the economic substantiation of the scientific preplanning recommendations.

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CSO: 1820/40

INVESTMENT, PRICES, BUDGET AND FINANCE

RELIABLE ECONOMIC INFORMATION NEEDED

Moscow PRAVDA in Russian 30 Dec 85 p 2

[Article by economist V. Selyunin and G. Khanin, candidate of economic sciences: "Dust in the Eyes"]

[Text] Without reliable information, efficient leadership is impossible. Leadership of the economy included. The information must be objective and true. This demand is supported by many PRAVDA readers. The notes published today are a response to their letters.

For the party and business executive and the economist figures and information are just the same as the chart for a sailor. A ship will not go far if the shallows and reefs are wrongly plotted in the navigational directions. Yet the "navigational directions" of the economy are quite often exaggerated. An example. It would seem to be the simplest thing to compute the volume of the machine-building product in monetary terms: it is sufficient to multiply the wholesale prices of the products by the number of pieces manufactured and add up the results. And inasmuch as the prices are considered stable, the cost volume of production should increase proportionate to the growth of the manufactured product in kind.

But we take the accounts of a number of enterprises and sectors of manufacturing industry and... we do not find this correspondence. In the present 5-year plan the manufacture of basic products in physical units increased 5-10 percent here, but in rubles, however, 40 percent and sometimes more.

Understandably, there are machines and machines. And if a sector has assimilated the production of new, progressive equipment, each product is valued more highly. More often, however, things are otherwise: the improvement in the consumer properties of products is negligible, but there is a pronounced leap in the price.

The cost of construction is growing rapidly also. There are no prices in the usual sense here--each facility has its own singularities and, consequently, its own estimated costs. It is not difficult to "justify" any increase in costs

if so desired. What results from this we will show in the example of ferrous metallurgy. It has not been overlooked, seemingly. In the present 5-year period the metallurgists have received almost 3.5 times more capital investments than in the Sixth Five-Year Plan. And the results? On an annual average in the Sixth Five-Year Plan the construction workers introduced capacity for the production of 3 million tons of pig iron, but in the present 5-year plan only 200,000 tons. It would seem that the metallurgists could not have made worse use of the allocated resources. But the reproach is not entirely correctly addressed. We recalculated the capital investments in the sector in constant prices. It transpired that investments grew only up to 1974 and then began to decline. Last year, for the first time in the history of ferrous metallurgy, the sum total of capital investments proved less than the actual wear of the fixed production capital. The reader will easily appreciate the practical significance of this conclusion.

Furthermore, the cost of the product is stable here, as in other raw material sectors, where the product selection is relatively stable and price manipulation is difficult. But if in cost terms production grows relatively slowly (strictly in accordance with the increase in the manufacture of the product in kind) and the fixed capital becomes more expensive, it is easy to understand that there is a rapid decline in the output-capital ratio or the output of products per ruble of capital. Judging by the accounts, in the period 1955-1980 the output-capital ratio fell in the sector threefold. In machine building, however, it rose by a factor of almost 1.5. Whence this difference? Can it be that in one sector duffers were assembled throughout, while the other had exclusively heroes? The solution is different. Fixed capital increases in costs for the machine builders also, of course, but the cost of the product there grows even more rapidly. We recalculated the output-capital ratio in comparable values and saw for ourselves: in the 25 years both in metallurgy and in machine building there was practically no change.

Such a finding will not surprise the experienced manager. The metallurgists, as before, use the bulk of the capital around the clock, but the machine builders, in turn, also have not raised the equipment shift-work coefficient.

Given the unreliability of economic information, it is difficult for the party committees to assess workmen's true practical qualities. Among the frontrunners are often those who manipulate prices more adroitly. What is worse, the confusion penetrates planning and management in general. A construction plan for a 5-year period is being drawn up, let us suppose. If the hidden growth of the wholesale prices for equipment and the construction products is not officially recognized, the planner demands of the client: you prove that the new facility will not be more expensive than the old ones per unit of capacity--otherwise, there is no point installing it. But it can only be proved on paper--after all, what a quarter of a century ago was built for R1 million required in the present 5-year plan, according to our calculations, just under R3 million. In order to squeeze himself into the plan the client lowers the estimated costs of the future facility and subsequently reconfirms the estimates many times over in conformity with the true costs and the growth of prices in the course of construction.

Whence a delay in the introduction of capacity and the growth of incomplete construction. The construction plan becomes shaky and conditional. It is not fortuitous that construction projects in our country are divided into particularly important, simply important and ordinary, although once a facility has been recorded in the plan, then its need for the national economy has thereby been recognized.

It would be an oversimplification to assume that the planners simply ignore the inaccuracy of economic information. For example, when planning material consumption they establish the fantastic targets for a reduction in metal consumption per ruble of machine-building product and per R1 million of construction-installation work of 4-5 percent a year, which is far in excess of the highest world achievements in this sphere. This indirect method takes into consideration the growth of wholesale prices and to a certain extent holds back the increase in material consumption.

Figures must be accurate. Otherwise what good are they to the party and business executive? The history of the Soviet economy teaches that in periods when economic information has been sufficiently accurate, social production efficiency has risen rapidly. It is understandable--only by knowing the actual processes is it possible to forestall negative phenomena in the economy.

Incidentally, there is two-way communication here: when work is proceeding normally at an enterprise or in a sector, there is no need to embellish the situation in the accounts. Back in the 1930's the then department of statistics began an entire campaign under the slogan "For Reliable Figures". It was not possible at that time to see the work through to the end, and subsequently the desire also was blunted, seemingly. The statistical authorities are occupying quite a passive position today, however. One reads the articles of leaders of these authorities and the journal VOPROSY STATISTIKI and one involuntarily thinks that the problem being dealt with is of little interest to the specialists.

Time demands changes. Reliable information is the first condition of a change toward the efficiency of the economy. Otherwise we may obtain an intensification of production in the accounts, but not in practice. This is why we propose that the draft Main Directions be supplemented with the sentence: "Radically increase the accuracy of economic information".

8850/9869

CSO: 1820/62

GENERAL

ECOLOGICAL PROBLEMS FACING URBAN AREAS COMMAND ATTENTION

Legal Support Needed

Moscow KHOZYAYSTVO I PRAVO in Russian No 11, Nov 85 pp 67-70

[Article by Yu. Shemshuchenko, head of the department of legal problems of agriculture and environmental protection of the UkSSR Academy of Sciences State and Law Institute and doctor of juridical sciences: "Legal Support for Urban Environmental Protection"]

[Text] Every year we introduce new plants and factories and incorporate thousands and millions of hectares of new land. In conditions of the intensive development of the economy, it is not only especially important to observe the established legislative norms on nature conservation but also to refine these norms. The USSR Supreme Soviet decree "On Meeting Legislative Requirements on Nature Conservation and the Rational Use of Natural Resources," adopted on 3 July 1985 at the third session of the USSR Supreme Soviet, 11th convocation, speaks precisely of this. Specifically it says: "...continue work to refine nature conservation legislation and insure the development of the necessary normative acts in elaboration of current laws as well as bring the acts of ministries and state committees and departments into line with legislation on nature conservation and natural resource use."

Today we offer you an article which tells of the practical steps made in this important work.

More than 1,200 new cities have been founded in our country during the years of Soviet Power. It is anticipated that the number of urban residents in the Soviet Union will reach 80 percent of the total population by the year 2000.

Establishing cities as the primary human habitat has its advantages but also involves some costs, particularly of an ecological nature. Our conception of urban development presupposes eliminating these costs along with performing other tasks. The basic directions of this conception are reflected in the state plans of economic and social development and in the master plans for development and siting of production forces and settlement on USSR territory. Legal protection of the urban environment is implemented on the basis of the

general requirements of Soviet nature conservation legislation. But this too has its specific character resulting from the specific features of the urban environment.

Another characteristic feature of the present phase of environmental protection in cities is the introduction of the method of target programming of nature conservation measures on the basis of the achievements of scientific-technical progress begun in recent years. The 18 August 1983 decree of the CPSU Central Committee and the USSR Council of Ministers entitled "On Measures to Accelerate Scientific-Technical Progress in the Economy" was an important stimulus in this.

Positive experience in developing these programs has been accumulated in the Ukraine. At the present time comprehensive scientific-technical target programs on environmental protection have been developed and ratified and are being carried out there in the cities of Kiev, Kharkov, Zaporozhye, Donetsk, and Dneprodzerzhinsk, and many others. These programs do not replace the plans of economic and social development of the corresponding cities with respect to environmental protection but promote their optimal realization. Let us turn to some of these programs to make certain of this.

The comprehensive scientific-technical target program for Kiev, for example, entitled "Environmental Protection in the City and Rational Use of Natural Resources and Raw Materials" was ratified by joint decree of the Kiev gorkom and the gorispolkom of the Ukrainian CP in 1980. It is chiefly designed for the 11th Five-Year Plan and only certain projects will be completed in the 12th Five-Year Plan.

The program encompasses the issues of developing and introducing no-waste and low-waste technological processes in the city's enterprises as well as measures to reduce gas pollution and noise from means of transportation. In addition, structures for decontaminating industrial and domestic waste water and atmospheric emissions and systems for utilizing liquid and solid wastes are to be improved and the city is to be landscaped using plants which actively promote decontamination of the air basin.

The Kiev Scientific Research Institute of General and Municipal Hygiene imeni A.N. Marzeyev is the head coordinating scientific organization while the Gorsistemotekhnika Scientific Production Association of the Kiev Gorispolkom is in charge of the practical work to organize and monitor the program's fulfillment. In all, more than 100 scientific research institutes of the UkSSR Academy of Sciences and planning and design institutes and enterprises have been enlisted to implement the program. The Kiev party gorkom and the gorispolkom as well as the UkSSR Academy of Sciences presidium are carrying out general monitoring of progress in fulfilling the program.

Certain results of this work may already be summarized. For example, the Leninskaya kuznitsa Plant, the Bolshevik Plant, and the Krasnyy ekskavator Production Association have introduced highly efficient gas burners, which made it possible to reduce natural gas consumption by 20-30 percent and cut the number of harmful atmospheric emissions in half. More than 50 small boiler houses have been eliminated during the time the program has been in

effect and a number of enterprises which were polluting the environment were moved away from the city. Planning and design work on gas and waste water decontamination has been performed. The first phase of the automated system for monitoring atmospheric air quality has been put on line. All this made it possible to reduce the city's air pollution by 20 percent.

By decision of the Kiev Gorispolkom, a draft of a new comprehensive scientific-technical program on environmental protection for the city for the 12th Five-Year Plan is now being developed.

Dneprodzerzhinsk can serve as another example of comprehensive solution of nature conservation problems in conditions of a major industrial center. Metallurgical, chemical, and coal-tar chemical industry enterprises are located here; this creates substantial difficulties in the work to insure favorable ecological conditions. The Dneprodzerzhinsk residents appealed to the UkSSR Academy of Sciences for help in this. In May 1979 an agreement on scientific-technical cooperation was signed between the Academy of Sciences and the ispolkom of the Dneprodzerzhinsk City Soviet; this agreement became the normative base for their joint activity. A comprehensive plan was ratified in accordance with this agreement. It envisions developing low-waste and no-waste technologies, new models of equipment for reducing harmful emissions into the water and air basins, automated systems for monitoring pollution of the atmosphere, methods of utilizing industrial waste products, and the like for Dneprodzerzhinsk enterprises. Twenty-five economic contracts have been concluded under the auspices of this plan.

Some 30 academic and departmental scientific research institutes, VUZes, and industrial enterprises were enlisted to realize the agreement on scientific-technical cooperation. Of course, the problem of coordinating and monitoring their work immediately arose. In order to solve it, the ispolkom set up a permanent headquarters with participation by specialists of the city's industrial enterprises. The deputy chairman of the gorispolkom supervises the activities of the headquarters. The legal status of the headquarters is defined by a statute ratified by the gorispolkom. In accordance with it, the headquarters coordinates the scientific research developments of the city's institutions and enterprises, monitors the fulfillment of nature conservation measures, and takes part in reviewing plans of scientific research projects in the field of environmental protection. Moreover, members of the headquarters included in commissions are enlisted to work on ecological substantiation of plans for construction and reconstruction of enterprises, shops, and individual production facilities.

The persistent organizational work is producing fruit. Of the 22 scientific research and design projects planned for the 11th Five-Year Plan, most have already been carried out and their results have been or are being introduced into production. For example, the Dneprodzerzhinsk Azot Production Association has begun to use the catalytic method of removing harmful oxide emissions from carbon dioxide. On the whole, atmospheric emissions have been reduced by 30 percent at the city's enterprises.

Nonetheless, the question of the need to improve the organizational-legal support of the corresponding programs arises in the work to continue to solve

urgent environmental protection problems. In the examples of Kiev and Dneprodzerzhinsk it is apparent that in these cities the functions of organizing, coordinating, and monitoring the fulfillment of the corresponding programs have been entrusted in the one case to the Gorskistemothekhnika Scientific Production Association, and in the other, to a city headquarters set up for this purpose.

The creation in recent years of interdepartmental scientific-technical councils on environmental protection under the ispolkoms of the city Soviets of People's Deputies is also a new organizational form of the community's participation in the concept of urban scientific-technical nature conservation programs. Such councils now operate in certain cities of the Russian Federation, the Ukraine, and a number of other Union republics. In Moscow, for example, the interdepartmental scientific-technical council on problems of increasing environmental protection and using natural resources rationally operates under the Moscow Gorispolkom and conducts its activities under the corresponding statute. The same type of council has also been formed under the ispolkoms of the rayon Soviets in the city of Moscow.

In the UkSSR, interdepartmental environmental protection councils have become effective assistants to the ispolkoms of city Soviets of People's Deputies in developing scientific-technical nature conservation programs and organizing work to realize them. Members of these councils include representatives of the ispolkoms of city and urban rayon Soviets of People's Deputies and nature conservation and sanitary organs as well as scientists, VUZ teachers, and specialists. Deputy chairmen of the ispolkoms of city Soviets of People's Deputies usually head these interdepartmental councils.

The interdepartmental councils operate on the basis of statutes concerning them. Analysis of these statutes shows that the following functions are mainly entrusted to this type of council: preparing proposals to develop comprehensive scientific-technical target programs on urban environmental protection; taking part in discussions of these programs at meetings of ispolkoms and in their worker commissions; coordinating the activities of the city's enterprises, organizations, and institutions to fulfill the corresponding programs; and monitoring progress in realizing measures envisioned by these programs and informing the ispolkoms of the city Soviets of People's Deputies on this progress.

Moreover, interdepartmental scientific-technical councils participate in developing nature conservation measures for drafts of plans of economic and social development of cities, prepare the appropriate questions to be reviewed at sessions of city Soviets of People's Deputies and at meetings of the standing commissions of these Soviets, conduct scientific-practical conferences on environmental protection problems, and the like.

The Interdepartmental Scientific-Technical Council on Comprehensive Environmental Protection Problems and the Rational Use of Natural Resources under the UkSSR State Committee for the Protection of Nature gives methodological guidance for the activities of the interdepartmental scientific-technical councils in the republic as a whole. This helps increase

the work level of these councils and through them carry out a uniform scientific-technical policy in the environmental protection field.

Let us note that the organization of the interdepartmental scientific-technical councils was not exclusively linked to the introduction of the target program method of solving urban nature conservation problems. But in view of the progressiveness of this method, today most councils are not only actively participating in realizing comprehensive scientific-technical target programs on urban environmental protection but in a number of cases are also acting as the initiators of their development. Thus, at one of its meetings the interdepartmental scientific-technical environmental protection council under the ispolkom of the Donetsk Oblast Soviet of People's Deputies reviewed the question "The Condition of Nature Conservation Work and of the Use by Industrial Enterprises of the Achievements of Modern Science and Technology to Normalize the Ecological Situation in the City of Kramatorsk." It recommended that the ispolkom of the Kramatorsk Soviet of People's Deputies develop a comprehensive scientific-technical target program to protect and normalize the environment to 1990. This program is presently in the implementation stage.

Despite all the significance of these councils, however, one must not fail to see that their potential is still not being used adequately. This is related to the disparity and vagueness of the legal status of the councils and the sometimes incorrect interpretation of their goals and purpose. Developing model statutes on these interdepartmental scientific-technical councils could to a substantial degree help eliminate these shortcomings.

In our opinion, along with this the comprehensive scientific-technical target programs on urban environmental protection themselves need a great deal of legal and material support. Their legal position is now determined by the decisions of the ispolkoms of the corresponding Soviets of People's Deputies independently or jointly with party organs. And the rights and duties of those who carry out the program are not always precisely and unambiguously established. Many programs represent the simple sum of nature conservation measures envisioned by plans of economic and social development of the cities. These programs are not always correlated with the cities' master plans of development and with comprehensive nature conservation plans or with the corresponding environmental protection plans of the oblasts and other regions.

Questions of the financial support of comprehensive scientific-technical target programs for urban environmental protection have not been finally resolved. The capabilities of city budgets are limited in this matter. And a great deal here depends on participation by higher-ranking enterprises and organizations located in the city in financing scientific-technical nature conservation developments and on combining their capital.

The current practice of setting up nature conservation funds is also of interest in the search for ways to solve this question, it seems. These funds, for example, have been formed in a number of European socialist countries (Hungary, the GDR, and ChSSR). And the first experience in setting up the appropriate fund has appeared in our country. In 1984 Estonia formed an experimental fund for environmental protection and rational use of natural resources. It is designed to finance work on environmental protection and

clean-up steps for populated points, carried out jointly by state management organs and the enterprises which make deductions into this fund. It seems that capital from these funds, which are also being set up in other Union republics, would also be of great help in financing the comprehensive scientific-technical target programs for environmental protection of cities, krays, and oblasts.

In our opinion, the contract form of relations between enterprises and scientific organizations which develop comprehensive scientific-technical programs merits broader dissemination. This form has already proven itself in practice. In the current five-year plan, for example, in fulfilling the corresponding program, enterprises and scientific organizations of Kiev concluded 11 agreements to develop and introduce no-waste technologies with consideration for environmental protection requirements. In the forthcoming five-year plan 90 such agreements are to be concluded.

And one more observation. On the level of prospects for development and adoption of a Union law on environmental protection, it would be advisable to envision the inclusion of a section "Environmental Protection in Cities and in Other Populated Points," as was done, for example, in the Hungarian law "On Protecting the Human Environment" and in the corresponding laws of certain other socialist countries. It would be advisable to use the norms of this section to resolve, in addition to other questions, the fundamental questions of urban environmental protection, using the comprehensive scientific-technical target programs for this purpose.

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Economic-Ecological Substantiation

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA EKONOMICHESKAYA in Russian No 6,
Nov-Dec 85 pp 81-90

[Article by K.B. Lvovskaya: "Methodological Principles of the Ecological-Economic Substantiation of Urban Environmental Protection Measures"; passages enclosed in slantlines printed in italics]

[Text] This article gives a classification analysis of the arsenal of urban environmental protection and improvement means, examines the correlation of economic criteria for selecting ecology-oriented measures and opportunities to use them, describes the general task of determining the optimal system of these measures, and constructs comprehensive economic evaluations of standard plan decisions on normalizing the urban environment.

The new phase in our country's nature conservation development is related to the transition from sectorial regulation of the technogenic impact on the biosphere to target program methods of solving regional ecological problems.

The 3rd session of the USSR Supreme Soviet, 11th Convocation, considered it necessary to "carry out a complex of measures to fundamentally improve the

condition of the environment in regions with a higher level of pollution of bodies of water and atmospheric air" [1] in order to further strengthen environmental protection and improve the use of nature resources. The problem of pollution of the air and water basins is reaching greatest urgency in large cities and industrial centers. Nature conservation programs which have been named territorial comprehensive nature conservation plans (TerKSOP's) [2] are now being developed for dozens of cities in our country. The specific structure of urban recipients, with an insignificant share of natural elements and an enormous share of population, moves the basic problems of the city TerKSOP's to the sphere of environmental protection, the main task of which is protecting man from unfavorable changes in his habitat. The "habitat" of the urban resident formed by the interaction of material-technical objects, landscape complexes, and the microclimatic conditions of the area represents a complex biosocial phenomenon whose content is broader than the traditional understanding of the environment. Designing a comfortable urban environment presupposes preliminary analysis and development of its individual elements and major subsystems. Territorial comprehensive plans (TKS's) of urban environmental protection encompass the totality of all natural-ecological components of urban space.

The following should be considered the main factors which determine the acuteness of the ecological situation on the urban scale: pollution of the surface layer of the air with toxic materials, suspended particles, and odoriferous compounds; violation of the acoustic regime of residential regions; contamination and depletion of water supply sources; changes in the geological and hydrological characteristics of developed territories; degradation of green plantings, landscapes, and reservoirs; and overloading of recreational systems.

Mass planning of urban nature conservation programs, which is now carried out by the joint efforts of various sectorial and departmental organizations, urgently needs adequate methodological support, and more than 20 institutes (including several academic institutes) headed by the TsNIIP [Central Scientific Research and Planning Institute] of Urban Development of the USSR State Committee for Civil Construction are taking part in preparing it. The final phases of the program's development are poorly represented in the current methodological recommendations on formulating TerKSOP's [3, 4]: formulation of a list of measures to perform urgent environmental protection tasks in the city and determination of the optimal complex of measures to insure the maximum national economic efficiency of the variant in conditions of real limits on all types of resources. A large number of particular projects in this area are deprived of constructive significance because of inadequate economic substantiation. Scientific publications on this question ([4-7] and others) do not cover it fully; specifically, the economic aspects of urban development management of the natural environment, which receives main attention in the following account, have been given little study.

Classification of Measures on Urban Environmental Protection

Urban environmental protection encompasses a broad set of the most varied ecology-oriented measures. Any measures which improve the natural and ecological living conditions of the population and conditions of development

of urban systems will be called /ecology oriented/. Among them are measures which perform the following functions:

- 1) prevention of anthropogenically-caused disturbances in elements of the biosphere and in their complexes (strictly /nature conservation/ measures: for example, norm setting for water consumption, the density and number of stories of buildings, and attendance limits in parks and sanctuaries and other measures to reduce operational loads on natural resources in urban boundaries; environmental protection or /antipollution/ measures which reduce the emission of pollutants into the environment occupy a special place here);
- 2) rational use and reinforcement of the assimilative ability of the environment (construction of tall smoke-stacks, siting of industrial enterprises within the city with consideration for the meteorological conditions of dispersion of harmful contaminants in the atmosphere, increasing planted areas, and the like; these measures are also /environmental protection/ measures);
- 3) prevention of the negative impact of the polluted or disturbed environment on recipients (/recipient protection/ measures: moving water intakes, conversion to underground water supply, resettlement of residents to other regions, noise-reduction window design, and the like);
- 4) stimulation of favorable functioning conditions for nature complexes in cities (/nature renewal/ measures: artificial plantings of plant crops, "landscape cuttings," protection of green plantings from pests and disease, and others);
- 5) improvement and increase in the capacity of the city's recreational facilities (/health/ measures).

Ecology-oriented measures in the city (henceforth abbreviated as EOM, or simply measures) are divided into production and urban development measures according to their affiliation with the main spheres of economic activity.¹ Their sources of financing, planning organization, targeted tasks, and the like are presently determined in relation to this affiliation. Lack of communication among the numerous sectorial and urban-development planning and design projects in the environmental protection field is a major obstacle when formulating TerKSOP's.

Technical, planning, and organizational measures are differentiated according to the means of realization of the ecological requirements.

/Technical/ measures include: refinement of technologies aimed at reducing the formation of waste products and establishing closed production processes and construction and operation of purification structures; erection of tall smoke-stacks and noise-absorbing shields; organization of surface run-off; application of anticorrosion surfaces; clean-up of urban areas; and the like.

/Planning/ measures represent urban development decisions on the territorial location of functional zones and the space-volume combination of the city's material objects.

/Organizational/ measures include: recommendations on scientifically substantiated operating conditions for industrial enterprises; regulation of the work of urban institutions and transport; monitoring of the condition of the environment and management of the activities (including scientific planning) to improve the natural-ecological conditions of the city's development.²

As for intention, the measures may be single-purpose or multipurpose. Along with this generally accepted division [8], multipurpose EOM's should be divided into two types: /expressed/ or /unexpressed/. Among the measures with an expressed ecology orientation are those with one main result being impact on the environment or protection of recipients. Measures whose ecological consequences are insignificant as compared to other physical and social results are classified as unexpressed EOM's.

As activities to protect the environment develop and economical methods of specific solutions to ecological problems are exhausted, multipurpose measures, and among them unexpressed multipurpose measures, play an increasing role. In industry this is related to the introduction of progressive technologies which generate fewer waste products, and in urban development -- to the transition from the simplest transfers of certain ecologically incompatible projects to multifactor optimization of functional zoning of urban territory, to comprehensive reconstruction of residential areas, to active use of the health and protective qualities of green areas, and the like. The results of urban development measures are primarily social and do not always lend themselves to quantitative and even less so to value measurement, which complicates ranking their real significance and, consequently, evaluating their "expressed" ecological character." Inasmuch as it is impossible to reliably define the "ecological" component in expenditures for measures of this type, and in a number of cases the contribution of health factors to an integrated evaluation of the result cannot be identified either, fundamental difficulties arise in economically substantiating plans for urban environmental protection. This circumstance confirms the advantage of studying the urban environment as a unified whole and in the future moving from formulating individual TerKSOP's which anticipate the formulation of general plans to developing comprehensive programs for developing urban systems.

Economic Criteria for Selecting Measures

Economic criteria for selecting measures are designed to determine the optimal variant of the set of permissible alternatives. The variant which is optimal according to the economic criterion insures the maximum national economic effectiveness of realizing the projected measure. An admissible alternative here means a projected measure which is able to solve the problem posed and which satisfies the exogenic restriction (limited resources, the minimum level of goal achievement, and the like). Let us designate the multitude of admissible alternatives as $I = \{1/1 = 1, 2, \dots, N\}$.

The most general criterion for selecting the optimal variant of the set of measures I is the /maximum of economic effect/ \mathfrak{Z}_i from realizing variant i:

$$\mathfrak{Z}_i \rightarrow \max_i, \quad (1)$$

where $\mathfrak{Z}_i = P_i - 3_i$; P_i and 3_i the comparable economic evaluations of all results and expenditures related to measure i. This criterion is useful for comparing the effectiveness of any EOM's whose results lend themselves to cost evaluation.

Under the condition of the identity of the interlinked social and economic results of the EOM's being studied, the optimal variant can be selected using the criterion of the /minimum of aggregate ecological costs/

$$3_i + Y_i \rightarrow \min_i, \quad (2)$$

where Y_i is the residual amount of economic loss from the ecological discomfort of the urban environment after measures i are realized.

In methodological outlines on formulation of urban TerKSOP's, economic loss is interpreted as the sum of calculated national economic expenditures which compensate for the result of the disturbed environment's impact on recipients. Expenditures to prevent the negative impact of a polluted environment on recipients ascribable in [9, 10] to economic loss are part of the cost of the projected EOM's.

Criterion (2) should be used when substantiating:

single-purpose EOM's; measures with easily isolated expenditures for a target solution of ecological problems and approximately equal interlinked effects (in this case the amount 3_i , used in formula (2) does not correspond to all expenditures for measure i, but only the part of them with an ecological intent; multipurpose EOM's whose "nonecological" results cannot presently be measured in money but are comparable according to social requirements.

Let us note that for single-purpose EOM's, criteria (1) and (2) are equivalent. In fact, if the result of measure i is only to prevent loss from ecological disturbances equal to $\Pi_i = Y_0 - Y_i$, where Y_0 and Y_i are the initial and residual economic loss, respectively, then $\mathfrak{Z}_i = \Pi_i - 3_i$, and the maximum amount $\{Y_0 - (Y_0 + 3_i)\}$ is reached with the condition of the minimum $\{3_i + Y_i\}$. In fact only in the last case does criterion (2) play an independent role which is not reducible to criterion (1).

The elementary criterion for selecting the optimal measure is the /minimum of aggregate capital/ and /operating expenditures/ converted to a compatible scale with consideration for the time factor for achieving the exogenically desired results:

$$3_i \rightarrow \min.$$

(3)

In essence, criterion (1) stems directly from criterion (2), since economic losses from disturbances in the environment expected after the variants under review are realized should approximately coincide by virtue of the a priori equivalence of the ecological consequences of the measures. However, using it means that the final condition of the city's environment is determined without consideration of economic factors and, generally speaking, is not optimal in terms of the complex of socioecological conditions. In connection with this, [7] indicates two possibilities for the strict application of this criterion which correspond to extreme situations in the field of the program's resource support and dictate the targeted tasks of environmental protection for the region in the program period: establishment of assignments to achieve the norms of the minimum permissible level of environmental quality or the norms which satisfy the highest sanitary-hygienic and biological requirements. Let us add that for cities which need to develop draft TerKSOP's, the second situation is highly unlikely. However, during practical work on particular drafts, they must resort to this criterion (explicitly or implicitly, through interpretation of the result as savings of expenditures for alternative EOM's) when substantiating measures for which methods of economic evaluation of the consequences do not yet exist.

As a result of the program nature of TerKSOP's, the basic object of economic substantiation when formulating drafts is systems (complexes) of measures rather than particular measures. An EOM system means a particular set of mutually compatible measures of various types, with regulated schedules of implementation and amounts of capital and operating expenditures, which realizes the targeted assignments for the calculated period.

If variants of EOM systems are formulated which are permissible from the standpoint of the economic and socioecological needs of the city's development [7], then the optimal variant can be selected according to one of the above-mentioned criteria (1) - (3) with consideration for the affiliation of all the comparable alternatives to the sphere of its applicability. Obviously, with the transition to systems of measures, the possibilities for using criteria (3) and (2) are substantially narrowed while those for criterion (1) increase.

In view of the complexity of the process of formulating the full set of permissible variants of EOM systems, developing algorithmic procedures for determining the optimal variant on the basis of performing the following task is important:

$$3_k \rightarrow \max_k$$

(4)

$$R_k \leq \bar{R}^{(j)}, \quad (5)$$

$$s_k^{(j)} \in S_{\text{don}}, \quad (6)$$

$$k \in K. \quad (7)$$

Here K is the set of all combinations (complexes) of measures within the total number of possible particular measures, \mathfrak{D}_k is the aggregate economic effect of the combination k (it is usually assumed that $\mathfrak{D}_k = \sum_{i \in k} \mathfrak{D}_i$, although the complex of measures can have a synergetic effect on recipients); R_k and $\bar{R}^{(j)}$ are, respectively, vectors of the volumes of different types of resources needed to realize the complex of measures k , and of the limits of restricted resources in the j -iteration, $S_k^{(j)}$ is the set of parameters which characterizes the projected condition of the environment after complex k is realized, and S_{don} is the set of permissible values of parameters of the condition of the city's environment. The main difficulty in the practical performance of the task (4)-(7) is in the existence of condition (6); however, rejecting this limitation may lead to a situation where the complex of measures which is optimal within the framework of the initial ($j = 0$) limit of capital investments (based, as a rule, on the dynamics of nature conservation expenditures in the preceding years) will not insure fulfillment of the a priori social requirements to eliminate (prevent) a crisis ecological situation in the city. The by-stage procedure for performing task (4)-(7) can be organized in general form in the following way.

I. The solution $K^{(0)}$, which satisfies the conditions (4) and (5) when $j = 0$ and $k \in K$ is found.

This phase has already been reinforced with methodological support: a constructive method of approximate solution of the system (4-15) when there is a single resource limitation on capital investments was proposed at the USSR Academy of Sciences Central Economics-Mathematical Institute (by L.V. Dunayevskiy), while the Belorussian Department (BO) of the Power Engineering Industry All-Union State Scientific Research and Planning and Design Institute (VNIPI) developed an applied model for calculating the optimal set of measures to reduce contamination of the air basin by stationary sources.

II. The fulfillment of condition (6) is verified. If $s_k^{(0)} \in S_{\text{don}}$, then $K^{(0)} = K^*$ is the desired complex of measures.

The performance of this operation presupposes constructing set S_{don} for particular objects of the TerKSOP. An urgent task of scientific research in the field of environmental protection is development of a constructive approach to defining this set (speaking more precisely, its lowest level), that is, substantiation of norms of the permissible level of environmental quality and well-being of nature complexes suitable for the role of mandatory standards. At the same time, the selection of proper and adequate indicators which form the set S_{don} represents an independent problem. These questions have been repeatedly discussed in the literature [7, 10-13], and others).

Here I would like to dwell on the specific features of evaluation and norm-setting of the condition of the city's environment related to the operation of the territorial factor.

In the planning stage of particular TerKSOP's, the condition of the environment should not be characterized aggregately, for the entire territorial unit, but differentially, by individual regions of the city. The multifunctional use of a relatively small area which defines the fundamental zonal differences in the permissible level of environmental quality is organically inherent to a city. A large city has a system of 20 functional zones which show the specific requirements for certain natural-ecological components of the urban environment. So, recreational and therapeutic-health zones need stricter norms of atmospheric pollution; territories of dense multistory buildings must have especially good engineering-geological conditions; the rational structure of the landscaping of residential areas differs sharply from a similar structure, let us say, of the sanitary-protection zones of industrial enterprises, and so on. The primary goal of the TerKSOP is to insure permissible natural-ecological conditions not on the average in the city but in each of its zones and in each residential area (especially since the need to formulate TerKSOP's of certain cities stems from the emergence of a critical situation precisely in particular parts of them).

Leaving aside the question of the particular method of measuring the condition of the environment in regions -- be they PDK-type [maximum permissible concentration-type] indicators, PDU-type [maximum permissible level-type] indicators, and the like, let us only note that correctly constructed (with a threshold effect) integrated evaluations calculated according to the complex of natural-ecological factors with consideration of their importance to each territory can be successfully fulfilled in (6). Specifically, they possess the advantage that they substantially reduce the size of the vector $S_n^{(*)}$, making performance of the task easier. In principle, obviously, it is possible to use a generalized city-wide indicator, if the changes in the different zones have different specific shares of it.

The multiplicity and variety of the environmental parameters which are being considered in the TerKSOP's introduce another facet in the task of ecological norm-setting and economic substantiation of measures. Zonal norms for each component of the city's environment, on the one hand, and the economic evaluations of the results of the EOM's -- on the other -- should be balanced in such a way that the ranking of the measures by their economic effectiveness (or the solution of tasks (4)-(5) under an adequate limit of resources) insures the priority of the variant for achieving the minimum normative values of all parameters of the environment as compared to the variant of the substantial ("above-normative") improvement of a number of parameters (by individual natural components or individual regions of the city) while keeping the rest on the "impermissible" (that is, unable to satisfy condition (6)) level.

Taking into consideration what was stated above, let us examine the alternative $S_n^{(*)} \notin S_{\text{дон}}$.

III. The complex of measures k^* which maximizes the amount \mathcal{J}_k under the condition that $s_k^{(j)} \in \varepsilon(s) \cap \bar{S}_{\text{don}}$, $k \in K$, where S is the lowest level of the set \bar{S}_{don} , and $\varepsilon(s)$ is the small circle of values s , which insures the solubility of this task while the limits of resources are established on the level $\bar{R}^* = R_*, \geq \bar{R}^{(0)}$.

Assuming the method of truncating \bar{S}_{don} is known, let us examine the practical possibilities of performing the task set. Direct review of all the complexes of measures is not realistic because of the enormous number of combinations and significant expenditures of machine time for calculations $s_k^{(j)}$ for each k . It should be added that establishing a functional link between particular measures carried out at sites with impact on the urban environment and indicators of the condition of the environment is very complicated. Current methods of calculation are far from perfect and do not encompass all ecologically fundamental factors; as an example, the sanitizing impact of measures to improve the transport system, develop the green belt of cities, and such on the urban air basin has not been adequately studied. The accelerated development of methods of this type from the standpoint of various physical-geographic means and groups of measures is necessary to the successful formulation of draft TerKSOP's.

In this way, searching for an approximate solution makes sense. One of the methods of this search used in the methods of the BO VNIPI Energoprom for achieving the level of PDK is the iterative increase in the limits of resources until the optimal plan of the task (4)-(5) does not satisfy condition (6). Another variant of the search presupposes organizing an intelligent procedure for expanding the complex of measures $k^{(i)}$ obtained in stage I, for example supplementing the initial set of measures in order of diminishing economic efficiency (in the sense of the particular economic effect \mathcal{J}_i) of using capital investments or the most limited resource.

Ecological-Economic Evaluation of Urban Development Planning Measures

Despite the fact that normalizing the environment of populated areas by planned means is widely practiced in urban development [14, 15], to this point it has no corresponding economic substantiation. The economic research on ecological problems needed to construct a methodological basis for ecological-economic calculations devotes much less attention to urban development activity than to production activity. The only official methodology in this area [9] has been formulated for antipollution measures carried out at industrial sites. The methodological difficulties of determining the economic effect of urban development EOM's are also related to the general state of the theory of economic efficiency of urban development, which uses mainly comparative indicators of savings of calculated expenditures [8, 15, 16].

The latter is justified when we are speaking of evaluating the planned aspects of a comprehensive urban development measure or a certain plan decision being realized using technical means -- construction of new projects, reconstruction of old regions, establishment of wooded parks, and the like. Inasmuch as there are no plan measures in pure form, evaluating their economic effectiveness means evaluating the "contribution" of the planning factor to

the effectiveness of the actual project. In this way, the effect of the plan decision and the effect of the urban development measure as a whole should be differentiated. The first is by nature a comparative quantity and a constituent part of the latter.

Evaluation of the planning factor of the effectiveness of an EOM may be used to select the variant in those cases when other urban development features of the drafts being compared are roughly the same.

The creation of "buffer" (sanitary-protection) zones around pollution sources is a common urban development measure to protect recipients. This measure occupies an exceptional position in degree of explicitness of its planned and ecological orientation.

Economic evaluation of the consequences of converting territory bordering on an industrial site into a sanitary-protection zone (SZZ) can be represented as the amount of economic loss averted by changing the structure of the recipients in the zone being studied. The averted economic loss Π_{cz} is considered the difference in economic losses caused by yearly pollution emissions from the source being examined in cases of alternative (for territories under reconstruction -- preceding) and "buffer" types of use of urban territory in accordance with the recommendations contained in [8].

Expenditures $З_{cz}$ for establishing sanitary-protection zones include the following components:

a)/on territories of new construction/: costs of extending supply lines while increasing the area of the urban territory as a result of the creation of a CZZ; increase in expenditures for incorporating territory being removed from the urban development for locating this construction site during the period of calculation as compared to the variant with no CZZ; expenditures for improving and landscaping CZZ's;

b)/for territories under reconstruction/ in addition those listed: expenditures for tearing down the existing development minus income from realizing liquid funds; expenditures related to the construction and operation of new housing to replace the housing torn down (capital investments in new construction with consideration for the difference in expenditures to operate the old and the new housing calculated according to the residual service life of the housing torn down); the difference in expenditures for transforming part of the existing development for other permissible functions in CZZ's, and expenditures for new construction of similar sites.

The economic effect of creating sanitary-protection zones $\mathcal{E}_{cz} = \Pi_{cz} - З_{cz}$ is essentially the difference in amount which makes it possible to assess the effectiveness ($\mathcal{E}_{cz} > 0$) or ineffectiveness ($\mathcal{E}_{cz} < 0$) of the planned gaps as compared to compact development. This indicator should be used primarily to compare the variant of the plan decision with the different variants to reduce

pollution emissions using technical-technological means in terms of criterion (1), but not for the purposes of ranking the whole series of EOM's.

Another measure of a planned nature is moving the pollution source -- the industrial enterprise (shop, power plant) -- outside the city or region limits. Despite the determining role of the planned decision, technical means, including production means, are used in this measure to a substantial degree.

The annual economic effect from realizing the planned decision i to move an enterprise is figured according to the formula

$$\Theta_i = U_i - (V_i + C_i + 3_{mi}) + \Theta_i^0 \quad (8)$$

or (as the difference quantity) according to the formula

$$\dot{\Theta}_i = \Theta_i - (U_0 - V_0 - C_0) = \Delta U_i + \Pi_i - (\Delta C_i + 3_{mi}) + \Theta_i^0 \quad (9)$$

where i is the number of the proposed area for moving the site being studied ($i=0, 1, \dots, N$, $i=0$ corresponds to the variant rejecting moving the enterprise);

U_i , V_i , C_i are the value (cost) of realized output, economic loss from contamination of the environment, and current expenditures corresponding to the i draft; 3_{mi} is the given expenditures related to moving the enterprise outside the city (region) limits; Θ_i^0 is the effect of functional redesignation of the liberated territory -- the savings in summary expenditures for using the liberated territory as compared to the variant for moving similar projects to new territory

$$\begin{aligned} \Theta_0^0 &= 0; \Delta U_i = U_i - U_0; \Delta C_i = C_i - C_0; \\ \Pi_i &= -\Delta V_i = V_0 - V_i. \end{aligned}$$

The amount 3_{mi} includes expenditures to dismantle and transport the project; expenditures for compensating losses from withdrawing land from its former type of use; expenditures for engineering development of the territory, additional supply lines and transport, and for installation work to restore and modernize the enterprise.³

The values ΔU_i and ΔC_i in formula (9) are assumed not to be zero, since the installation of the industrial facility in a new place is usually accompanied by the comprehensive modernization of production. Consequently, two factors influence the size of the averted loss: $\Pi_i = \Pi_i^a + \Pi_i^m$, where the planned component Π_i^a reflects the change in the structure of the recipients in the zone of active pollution, and the modernization component Π_i^m is the change in the production parameters on projected variant 1.

The contribution of the planning factor to the total economic effect of realizing draft 'E' is measured by the quantity \mathfrak{Z}_i :

$$\mathfrak{Z}_i = \Pi_i^n - \mathfrak{Z}_m^n + \mathfrak{Z}_i^0 \quad (10)$$

where expenditures for modernizing the project are excluded from \mathfrak{Z}_m^n .

The experience of developing specific plans shows that city planners are unable to take all production indicators of the EOM's they are designing into account; therefore, the effectiveness of the plan decision must in fact be evaluated according to formula (10), which also requires labor-intensive preparation of special information. But even without rigorous calculations it is clear that this evaluation will be very modest since projected proposals to move enterprises are as a rule based on the possibility of cleaning up the environment of the polluted region at the expense of a certain deterioration of air quality in a region with comparatively favorable natural-ecological living conditions for the population. In exactly the same way complete expenditures for setting up CZZ's are not paid back in the amount of the averted economic loss. The main shortcoming of urban development management of the condition of the urban air basin is that it only reduces the intensity (degree) of impact on the population of pollutants entering the atmosphere. In this case, planned means are inadequate for the ecological problem. However, successful plan decisions can be an effective means of preventing those disturbances in the environment which arise in the process of strictly planned urban incorporation of territory, which deals with numerous natural factors: the geological formation of the ground; the system of ground waters; the uniqueness of natural landscapes; microclimatic features, and the like.

In connection with this, it is essential to have a clear idea of the interrelationship of the fundamental directions in performance of the main tasks of TerKSOP's. The main reason for developing TerKSOP's lies in urban industrial development. Urban development planning factors of environmental pollution in most cases have a secondary effect, intensifying the negative technogenic effects: emissions of enterprises and motor transport, wastes discharge, storage of solid wastes, and the like. The technical and planned means of protecting and improving the urban environment are ranked accordingly. Measures to improve production technologies occupy the key positions in the optimal complex of EOM's. Urban development measures are designed to eliminate those negative phenomena in the environment which are characteristic of any urbanized territory with concentrated industrial production (including "ecologically clean" in the technological sense).

Cost comparison of the physical and social consequences of the outlined measures with expenditures for their implementation is the main prerequisite of ecological-economic substantiation of draft TerKSOP's. Approaches to calculating the economic effects of very uncomplicated plan decisions which protect the population from the impact of high concentrations of pollutants were examined above. The construction of comprehensive economic evaluations of multipurpose urban development measures designed within the framework of TerKSOP's, such as the ecologically oriented adjustment of functional zoning of urban territory, reconstruction of developed parts of the city with

consideration of ecological requirements, development of a system of urban green plantings, and others are of great theoretical and practical interest. Activization of scientific-methods research in this direction is becoming especially important in connection with the task of accelerating the development of refined methods of determining the economic efficiency of nature conservation measures and losses from environmental pollution.

FOOTNOTES

1. All measures on the formation of the city, including its planning, designing, construction, and functioning [8] are called urban development measures.
2. This type of measures is not examined in the article.
3. It makes no difference which of the two formulas -- (8) or (9) -- is used to select the projected variant of moving the enterprise according to criterion (1), but it cannot be forgotten that the indicators of economic effect must be comparable when establishing the priority of different types of measures. Inasmuch as the averted loss is considered the ecological result, formula (9) should be given preference.

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KaSSR Environmental Protection Campaign

Alma-Ata NARODNOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 10, Oct 85 pp 63-67

[Article by K. Nasiyev, deputy chief of the nature conservation and rational use of natural resources department of KaSSR Gosplan, under the rubric "Man and Nature": "Environmental Protection Problems"]

[Text] As is well known, the KaSSR has the greatest area in the country with the one exception of the RSFSR. The metallurgical, chemical, mining, and petroleum extracting industries, agriculture, and animal husbandry are extensively developed there. And, understandably, regardless of the specifics each sector inevitably pollutes the water, soil, and atmosphere. Preventing undesirable changes in the natural environment is a problem of great socioeconomic significance, and it is being solved in our country from a national point of view.

A certain amount of work has already been done in this direction in Kazakhstan. Thus, 632 decontamination structures with a total capacity of 3.8 million cubic meters a day were put into operation in the 10th Five-Year Plan and in the first 4 years of the 11th Five-Year Plan; these structures made it possible to cut wastes discharge to slightly less than half their former amount.

Structures for the biological treatment of sewage have been built in Alma-Ata, Kapchagay, Issyk, Karaganda, Aktyubinsk, Dzambul, and other cities, and they are being built in Chimkent, Uralsk, Kokchetav, Petropavlovsk, and a number of populated points in Tselinograd Oblast. In the last 4 years alone sewage facilities have been built and equipped in many enterprises of the republic Ministry of Light Industry and in the Aktyubinsk Train Depot; a protective dike against surge waters of the Caspian Sea in the Kalamkas oil field in Mangyshlak Oblast and a filtering plant in the city of Aralsk have also been built.

During the same period new large capacities to treat waste water from the KaSSR Ministry of Nonferrous Metallurgy have been built; among them are the Talovaya Tailings Dump with a complex of decontamination structures, systems of recirculating water supply for enrichment factories at the Irtyshsk and Leninogorsk Polymetal Combines, and decontamination structures at Krasnooktyabrskiy Bauxite Mine Management projects.

Structures for supplementary treatment of waste water at industrial enterprises in Shevchenko and a sludge conduit at the Aktyubinsk Chemical Plant imeni Kirov were built in 1984, and the reconstruction of a reservoir with a recirculating water supply system was completed at the Ak-Su Mine in Tselinograd Oblast.

Work continues on converting many industrial enterprises, production associations, and whole sectors to no-waste or low-waste technology.

The KaSSR Ministry of Land Reclamation and Water Resources is making an important contribution toward solving the problem. Norms have been set for

waste water quality for practically all the republic's water users with this ministry's direct participation. Inventories of small rivers which indicate basins for which water conservation plans must be developed on a priority basis in the period 1985-1990 as well as measures to insure their purity and the optimization of water management have been composed. The "Statute on Water Conservation Zones" has been prepared.

Work to conserve the purity of atmospheric air is being carried out in a purposeful way. Whole sets of measures to reduce the pollution level of air basins were carried out in Alma-Ata, Ust-Kamenogorsk, and Dzhambul during the years of the 11th Five-Year Plan. Suction units were put on line at the Pavlodar Tractor Plant and the Yermak Ferroalloy Plant. Small neighborhood boiler rooms have been closed in many populated points and powerful dust and gas traps have been set up at major thermal power plants and at the Semipalatinsk Construction Materials Plant. Special permanent and mobile laboratories equipped with gas analyzers which are used to monitor the level of toxicity of automobile exhaust have been set up in the capital of Kazakhstan and in a number of oblast centers. The "Infralit" and "GAI-I" type gas analyzers with which all the republic's GAI's [State Automobile Inspection] subdivisions are equipped make it possible to efficiently test the toxicity of engines on general use highways.

Systems for purifying production wastes have been built new or reconstructed at some industrial enterprises such as, for example, the Ust-Kamenogorsk Lead and Zinc Combine, the Chimkent Chemical-Pharmaceutical Plant, and the Alma-Ata Heavy Machine Building Plant.

The degree of capture of harmful substances which formerly polluted the air basin has been increased as a result of the complex of measures.

Work to protect land resources is being expanded. Since the start of the 11th Five-Year Plan, 32,900 hectares of disturbed land has been reclaimed. Of them about 3,900 hectares are already under the plow. The amount of work to create and expand forested shelter-belts and artificial and natural green planted areas increases every year.

Reclamation work is being conducted at a high rate. From 1980 to the present time the area of irrigated land in the republic increased by 230,000 hectares; this includes 160,000 hectares more of irrigated plowed fields. In the same period the increase in the area of "liman" [estuary] irrigation totaled 70,000 hectares.

In the complex of nature conservation measures, a great deal of importance is attached to further development of the network of state reserves and preserves. The extremely large Markakolskiy Reserve in East Kazakhstan Oblast and Ustyurtskiy Reserve in Mangyshlak Oblast were set up in Kazakhstan in recent years. At the same time, Gosokhotnadzor [possibly State Hunting Supervision] organs, together with the office of the public prosecutor, the courts, the republic's Ministry of Internal Affairs, and social inspectorates are increasing monitoring of observance of the established reserve system. The struggle is being conducted against poachers. More than 1.4 million rubles in fines were exacted in the last decade just from violators in the

administrative system alone, and suits totaling some 1.6 million rubles were brought to compensate for material damage done to the State Hunting Fund.

The republic's social organizations are playing an increasing role in the cause of nature conservation and rational use of its resources. The central council of the nature conservation society organizes cycles of topical lectures in all oblasts and rayons of Kazakhstan, produces dozens of colorful posters and booklets, and together with the Kazakhfilm studio has created the documentary film "Nature in Kazakhstan."

Thanks to multilevel and purposeful work in Kazakhstan, the environment has been substantially improved.

One must admit that more could be done if all ministries and departments as well as the economic organizations subordinate to them completely and promptly incorporated means allocated to them for environmental protection. The KASSR ministries of Agriculture, Coal Industry, Forestry Industry, Food Industry, Power and Electrification, and Meat and Dairy Industry, where the planned volumes of capital construction for nature conservation projects have been only 15-47 percent fulfilled, have permitted the most delay in incorporating capital investments.

In this sense enterprises of Union subordination located in the republic also do not always set a positive example.

Specifically, the start of reconstruction of a shop to maintain layer water pressure to protect the Caspian Sea from the waste waters of the Teren-Uzek oil field is still being held up with the connivance of the USSR Ministry of Petroleum Industry, although its completion was intended for the end of this year. This same ministry disrupted the prompt introduction of a sewage pump station with a discharge collector at the Guryev Machine Building Plant, while the construction of block No 1 recirculating water supply system was not included in the plan for the 11th Five-Year Plan, despite the existing special decisions regarding it.

The USSR Ministry of Chemical Industry also systematically disrupts fulfillment of similar plan measures. Thus, in the final stage of construction of a sewage complex, including a treatment plant, two-ninths the amount of capital needed if the balance of estimated value were taken into account was allocated in the Aktyubinsk industrial zone for these purposes in 1984. Because of this same ministry, this is already the fourth year that the introduction of a complex of purification structures and sewage networks has been disrupted at the Inderskiy borate mine in Guryev Oblast. Initially the work was to be completed back in 1982.

The USSR Ministry of Railways is also doing an extremely unsatisfactory job of fulfilling nature conservation measures which envision completely stopping the discharge of untreated waste water into rivers and other waters which are part of the Arctic Basin. Here is one example in confirmation. This ministry plans to start construction of decontamination structures at the Tselinograd Railroad Car Repair Plant only in the next five-year plan period, even though the appropriate plans and calculations were completely ready in 1983.

Certain republic ministries and departments are doing work on water conservation projects at an intolerably slow rate. For example, contrary to established schedules confined within the 11th Five-Year Plan, the KaSSR Ministry of Power and Electrification does not plan to begin construction of decontamination structures at the operating Ust-Kamenogorsk TETs until 1988. And the planning-calculation documentation for these structures at the Tselinograd TETs is still being developed.

The position of the KaSSR Ministry of Food Industry, which decided to stop many years of planning-survey work on purification structures at the Karabulak Sugar Plant in Taldy-Kurgan Oblast, hardly conforms to environmental protection interests. As a result, expenditures totaling 76,000 rubles have been wasted, since water quality in the Karatal River is lower than the production discharges of this enterprise, according to information from the Semirechenskiy Basin Inspectorate, and does not satisfy normative requirements according to many indicators.

Construction of projects for the artificial biological purification of waste water is unjustifiably lagging in the northeast industrial zone of Dzhambul as well as in Kokchetav, Petropavlovsk, Uralsk, Chimkent, and Aksay (Uralsk Oblast). Construction of local purification structures has not yet begun in the Semipalatinsk POSh Factory of the KaSSR Ministry of Light Industry and in the Alma-Ata and Aktyubinsk Meat Combines of the KaSSR Ministry of Meat and Dairy Industry.

As was already indicated above, a great deal is being done in the republic to protect the purity of and further enhance the region's air basin. Particular ways to solve the problem, which becomes more and more pressing every year because of the rapid development of Kazakhstan's polytechnical industry and the accelerated rate of urbanization of its developed areas, have found expression in a number of directive documents.

Nonetheless, analysis of the situation locally shows that the practical realization of these important program documents has by no means been carried out everywhere.

For various reasons the republic Kaztsement Industrial Association of the KaSSR Ministry of Construction Materials Industry did not fulfill 9 of 17 intended measures of this type in the current five-year plan period. Among them were an electrofilter unit on the cooler of a rotating kiln and reconstruction of suction and fan systems for corrugated asbestos pipe production at the Chimkent Asbestos-Cement Design Combine. Schedules for reconstruction of trap systems are systematically disrupted, and proper attention is not given to questions of the uninterrupted work of units for removing dust, purifying, and conditioning gas at the Karagandatsement Production Association. And overall, of 260 sources of environmental pollution at the association's enterprises, 60 or 23 percent have no gas purification structures at all, while of the 200 remaining 82 are in technically defective condition.

Even more complaints on this level can be brought against the managers of the Soyuzfosfor Association under the USSR Ministry of Chemical Industry and the enterprises subordinate to it -- the Dzhambul Superphosphate Plant and the Novodzambul Phosphate Plant, the Dzhambul Khimprom Production Association, and the Chimkent Fosfor Production Association.

A final decision has not yet been made on the projected proposals for purifying the industrial discharges of the Ekibastuz GRES of the KaSSR Ministry of Power and Electrification. The degree of decontamination of gases by electrofilters in its power blocks is even lower than what was projected, while some of them are not yet functioning at all.

Kazakhstan's nature conservation and planning organs are also naturally concerned about the fact that in 1984 in the region as a whole enterprises of Union and republic subordination incorporated only 59 percent of the capital allocated for measures to insure the purity of the air basin. The following may be named the most backward here: in the KaSSR Ministry of Power and Electrification -- the Ekibastuz TETs (it incorporated 2.7 percent of the general ceiling on capital investments and 3.3 percent of the ceilings for SMR) and the Alma-Ata TETs-2 (corresponding figures -- 49 percent and 52 percent); in the KaSSR Ministry of Nonferrous Metallurgy -- the Ust-Kamenogorsk Lead and Zinc Combine (60 percent and 67 percent) and the Balkhash GMK (56 percent and 60 percent); and in the USSR Ministry of Ferrous Metallurgy -- the Aktyubinsk Ferroalloy Plant (26 percent and 52 percent), the Yermak Ferroalloy Plant (53 percent and 40 percent), and Karmetkombinat (65 percent and 78 percent).

The rate of work to bring land back into cultivation is still too low. There are already some 176,000 hectares of this land in the republic and of that more than half needs to be recultivated.

The largest area of depleted land is being used by the KaSSR ministries of Agriculture, Highways, and Nonferrous Metallurgy and enterprises of the USSR Ministry of Coal Industry, the USSR Ministry of Land Reclamation and Water Resources Glavrissovkhozstroy [possibly Main Administration of Rice Sovkhoz Construction], and the USSR ministries of Ferrous Metallurgy and Railways.

KaSSR Ministry of Agriculture enterprises fulfill only 50-60 percent of the plan for work to recultivate lands annually; as a result, lands are withdrawn from economic circulation for long periods of time. USSR Ministry of Railways organizations have even lower results (about 10 percent of all developed land). And the Aktyubinsk Division of the West-Kazakhstan Railroad accounts for almost one-third of that. The work is not being carried out there at all. There is not even the necessary planning-calculation documentation. In recent years not one hectare of the almost 200 hectares disturbed during prolonged exploitation at the Leninogorsk Polymetal Combine nor of the 1,140 hectares disturbed at the Zyryanovsk Lead Combine has been recultivated.

Work to construct antierrosion hydrotechnical structures is being done extremely unsatisfactorily in the republic (in 1984 -- only 39 percent of the plan). The same applies to the terracing of steep slopes. KaSSR

Goskomselkhoztekhnika organizations incorporate no more than 300 hectares a year while the annual plan is for 800 hectares.

Quite a lot needs to be done to improve, protect, and reproduce rare animals in the republic's nature reserves. In 1981-1985 the comprehensive target program "Development of Game Refuge Work in Kazakhstan" outlined the creation of four new reserves, but in fact Kazglavokhota prepared the materials for only one. As for existing state game refuges and hunting units, even this organization which is charged above all with monitoring hunting and regulating the republic's animal world on a scientifically substantiated basis does not have future plans for their development, and at this point there is no reliable information on the number of animals recorded in the KaSSR Red Book. But of course, our science should have an important word here too.

In solving the fundamental problems of nature management, a decisive role is attributed to the rational use of natural and, in particular, mineral resources. It should be said that work here is virgin land.

At the Sokolov-Sarbay GOK [Mining and Concentrating Combine], for example, the resolution of the question of setting up production which according to preliminary research would make it possible to extract other valuable components besides metal from ore is being delayed.

At the Lisakovsk GOK alone, with comprehensive processing of raw materials, aluminum oxide, phosphorous fertilizers, and various construction materials in addition to the main output could be obtained. Kazakhstan's mining enterprises still use extremely small quantities of strip mining rock to produce crushed stone and sand, Chegan clay -- for manufacturing claydite, and Dzhetysay asbestos waste for producing asphalt concrete. Other solid production wastes, in particular coal enrichment wastes, are also being utilized inadequately; some 500 million additional units of standard bricks could be produced a year in the republic on the basis of these wastes.

Large losses of coal and ore are allowed in preserved mine pillars. The reopening of coal layers under developed territories is being delayed because of chronic delay in work to flush the worked area.

The imperfection of the technology of this process and systematic interruptions of deliveries of cement also have a negative impact on increasing the extraction of minerals at nonferrous metallurgy enterprises, where mainly for these reasons the corresponding capacities are only 50-60 percent used. In this connection, perhaps we should think about building a special plant to produce astringents in the KaSSR Ministry of Nonferrous Metallurgy System.

In our opinion, it is advisable to also discuss the question of setting up a specialized organization to build nature conservation complexes, including purification structures for general use and dust and gas purification and similar projects, within the KaSSR Ministry of Construction of Heavy Industry Enterprises.

It seems that such organizational restructuring would help sharply increase capital construction of nature conservation projects and eliminate the still frequently tolerated dispersal of capital allocated for these purposes, which at times vastly increases the time needed for their introduction and increases the prime cost of construction-installation work being done. For example, the KaSSR Ministry of Housing and Municipal Services began construction in 1962 of sewers and biological purification structures with an estimated cost of 13.3 million rubles in the city of Petropavlovsk. Only 5.8 million rubles have been incorporated in the last 22 years. The incorporation of capital in percentages of estimated cost for construction of similar complexes totals 72 percent in Aktyubinsk (in the last 16 years), 59 percent -- in Aksay in Uralsk Oblast (in the last 12 years), and in Uralsk itself -- 64 percent (in the last 10 years). Obviously this requires no comment.

Life has quite convincingly shown that a comprehensive approach is needed to solve the problems of rational use of natural resources and environmental protection. Under the present structure of management of nature conservation organs, where they are subordinate to various ministries and departments (the KaSSR ministries of Land Reclamation and Water Resources, Agriculture, Forestry Industry, Fish Industry, and Geology, Gosgortekhnadzor [State Committee of the Council of Ministers for Supervision of Industrial Safety and for Mining Inspection] and UGKS [expansion unknown]) who give priority in their practical work above all to solving sectorial economic tasks, it is impossible within the framework of intradepartmental limitations to insure fulfillment of this important task efficiently enough. Departmental lack of communication and the lack of coordination of their activities on the regional and republic levels also hinder a systematic approach to nature management programs.

The implementation of a uniform state policy on environmental protection and rational use of natural resources urgently requires joining the efforts of all who are studying these questions. It seems that in order to do this a special republic organ should be created, as has been done in some other Union republics, with the broadest authority; the State Committee of the KaSSR Council of Ministers on Nature Conservation could become such an organ.

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Garbage Recycling in Leningrad

Moscow EKONOMICHESKAYA GAZETA in Russian No 1, Jan 86 p 9

[Article by V. Veselov and A. Shevtsov, Leningrad, under the rubric "Economy -- A Factor in Acceleration": "Initiative"]

[Text] Caption: Technology developed for the first time in world practice is in operation in Leningrad... The "fire worshippers" proposed a variant and retreated... The Tekhnostroeksport Foreign Trade Association is going into the foreign market with a new technology... Without waiting for instructions "from above..."

Every year 3.5 million cubic meters of domestic solid waste is formed in Leningrad. And as scientists' calculations show, it will steadily increase in the future.

What can be done with wastes? Today in most cases they are still handled as they were in ancient Babylon -- they are hauled to dumps. At one time Leningrad had four dumps. They occupied an enormous amount of territory -- up to 800 hectares of land. At the same time, the problem of protecting the environment became more and more burning since according to ecologists' definition, dumps are a long-term source of pollution.

Back in the 1960's, specialists undertook to solve the problem. Two variants were studied. The first envisioned building enterprises to burn up wastes and the second -- to recycle wastes. The "fire-worshippers," as the supporters of the first variant were jokingly called, had the strongest trump cards -- above all world experience. The method of burning urban garbage had become rather widespread by this time, while recycling technology virtually did not exist and itself had to be created.

Recycling fans pointed out the high cost of building garbage burning plants, the unprofitability of their operation (utilizing thermal energy covers only 10 percent of the operational expenditures), and the possibility of emitting harmful gaseous products of combustion into the atmosphere. And, finally, they pointed out that the furnaces would essentially be burning not garbage but valuable raw materials which could be used and thereby make the destruction of wastes profitable.

The second viewpoint prevailed. But the fundamental recycling plan still had to be determined. And once again opinions clashed and the recyclers' camp split. Some proposed setting up separate utilization by types of raw materials contained in the wastes. There really are very diverse components in solid domestic waste -- paper, plastic, textiles, shoes, glass, and metal. It is very tempting to utilize each of them by purpose, so to speak, which promises a greater economic effect than with the joint recycling of the entire mass into some one type of product.

Nonetheless, this effect will be completely "eaten up" by expenditures to sort the waste, objected critics. Moreover, sorting itself represents an extremely complex task in the technical sense. It is immeasurably more expedient to sort wastes before they go down the rubbish chute or tank, that is, gather them separately as secondary raw materials. This is the task of "Vtorresursov" organizations, but they were not ready either technically or organizationally for such a change in the scope and quality of their work.

Ultimately Leningrad adopted the plan for biothermal recycling of wastes into organic fertilizer -- compost, proposed by the capital's Municipal Services Academy. In 1970 the first plant for mechanized recycling of solid domestic wastes went into operation in our country.

Of course, the industrial technology for manufacturing compost from low-grade raw materials was not created in a vacuum. But Leningraders can still rightfully be considered the first to do so. They were the first ones in world practice to use large biothermal drums, which sharply increased the enterprise's capacity.

According to the initial technology, compost must be ripened in special fields for 3 months. Leningrad vegetable growers proposed combining this process with using unripe compost as biofuel in hothouses. The results were good. Now the compost initially "works" as biofuel and then it serves as fertilizer. The production cycle was reduced and the economic yield of output increased.

In the first year of operation the plan received a subsidy of 350,000 rubles; after it reached half its projected capacity it got 40,000 rubles. But when a second plant went on line and the projected capacity was incorporated (recycling 900,000 cubic meters of wastes and producing 140,000 tons of compost a year), production no longer lost money. Fertilizer from wastes enjoys steady demand and 24 of the oblast's sovkhozes and the Leningrad garden-park system buy it.

Today this is all a matter of the past. And if we are speaking of it in so much detail, here is the reason. By implementing the idea of industrial recycling of domestic wastes instead of burning them, the modest Leningrad civil engineers in a certain sense proved to be prophets, without claiming to be such, since it is precisely the concept of recycling which prevails in our day.

Here is a recent example. The West German journal BILD DER WISSENSCHAFT writes: "At the present time 25 million tons of domestic wastes are accumulated in the FRG, 70 percent is hauled to dumps, and 25 percent is burned. Today it is well known that accumulating garbage in dumps, like burning it, represents a danger to the environment. By the late 1980's, the FRG intends to build more than 50 enterprises to obtain compost for agriculture -- an ecologically pure final product -- from domestic wastes. It is assumed that before the year 2000 they will be able to get rid of the garbage of almost one-tenth of the country's population."

So, "intends," "assumed"... Meanwhile, not the least because of the successful experience of the Leningraders, the construction of garbage-recycling plants has become mass production in our country. They are already in operation in many cities. The series production of equipment has been incorporated and the All-Union Foreign Trade Association suggests in its prospectus that all those who want to "request more detailed information" to refer to this address: USSR, Moscow, "Tekhnostroyeksport."

In Leningrad itself construction has begun on a second biothermal domestic waste recycling complex with a capacity of 1.2 million cubic meters a year; a third complex of the same capacity is being designed. And this means that in several years all the city's domestic wastes will be recycled into biofuel and compost.

After the biothermal treatment of solid domestic wastes, their uncompostable part remains. It comprises approximately 25 percent of the initial mass.

"Today the main difficulty which must be solved in the next phase lies here," says the chief of the administration for decontamination of urban areas and streams of the gorispolkom ("Spetstrans"), Gennadiy Mikhaylovich Alekseyev. "'Tailings' of biothermal recycling must be hauled to dumps. In this way, the conversion to the progressive method of utilizing wastes still does not completely free us from this sad necessity. Of course, much less garbage has to be hauled to dumps, but, first, this is still a compromise solution and, second, a great deal of valuable raw material is lost in 'tailings' -- textiles, resins, plastic, and other goods."

The administration turned to Leningrad scientists with a proposal to study the possibilities of recycling uncompostable wastes. Specialists of the All-Union Scientific Research Institute of the Petrochemical Industry of the Lenneftekhim Scientific-Production Association began work.

It is probably worth explaining here why "Spetstrans" took up a job that was uncharacteristic of it. One of the secondary but important results of the work to utilize wastes which was developed was the fact that there appeared in Leningrad an interested "master" of urban wastes, responsible for the entire program of measures to use them. Preserving the old name and previous functions, "Spetstrans" was in fact converted from a simple garbage hauler to an organization to introduce progressive methods for recycling it. And the energy and resolve of Gennadiy Mikhaylovich played a rather large role in this conversion. The example of the Leningrad "Spetstrans" rightfully deserves careful study and broad dissemination.

But now a word to the lab head of the institute, Vladimir Nikolayevich Petrov:

"At first Alekseyev's proposal gave abundant food for local institute humor. But soon we got carried away with the task, which proved to be very interesting and far from simple."

Petroleum chemists proposed recycling wastes using the pyrolysis method. The equipment taken for the first and still only unit in the country for pyrolyzing wastes was again domestic, produced in series but for other purposes. Construction cost 1.5 million rubles. In 1982 a pyrolysis shop yielded the first tons of output -- pyrocarbon, an efficient substitute for graphite, which is widely used in the metallurgical industry. A consumer was found immediately -- the Leningrad Kirovskiy zavod Production Association.

"There are no analogues of this unit," said Vladimir Nikolayevich. "In places we felt our way, by the trial-and-error method, without knowing how the extremely heterogeneous raw material behaved away from the laboratory, in industrial recycling. And yet, although the unit is still far from its projected capacity -- 10,000 tons of pyrocarbon a year, we believe that only difficulties of a strictly technical nature remain."

Igor Kimovich Matveyev, the director of the garbage recycling plant agrees with this viewpoint:

"Some things have to be changed as you go along, and you have to pay to finalize the process. The pyrolysis shop keeps a special brigade of repairmen. Of course, it takes a lot of work, but no pioneering unit can get going without hard work. The main thing is that we see that it's working."

Meanwhile, the Leningrad civil engineers already have new worries. Before biothermal recycling of wastes, scrap metal is extracted by electromagnets. Not that much is collected in a year -- about 4,000 tons. Millions of tin cans are also "recovered" from the garbage among the most diverse metal objects. Sending them to be remelted without removing the tin from the sheet iron is pure wastefulness. And so in the 12th Five-Year Plan they decided along with the USSR Ministry of Nonferrous Metallurgy to set up one more production facility -- for removing tin from tin cans. The technology exists, but it was designed for using pure production wastes of zinc-coated sheet iron rather than for contaminated containers. Once again the task is one which no one has solved yet -- the creation of another first-in-the-country technological unit.

"Spetstrans" also took upon itself the "problem of lids" with metal cord which has been talked about so much but, unfortunately, in most cases only to stress immense difficulties of using this secondary raw material. Formally, the

civil engineers could have done without worrying about the perishing lids. But more than 100,000 tons of them a year are collected in Leningrad. A very valuable raw material is being lost.

Last year Spetstrans concluded another contract with the petroleum chemists -- this time on lids. Experiments have already been conducted, and on a rather large scale. They crushed 50 tons of lids with metal cord in a unit operating in one of the enterprises of the Krasnyy treugolnik Association, passed it through a standard rotary furnace, and obtained through pyrolysis pyrocarbon which was easily separated from the metal -- once again a substitute for scarce graphite.

The ispolkom of the Leningrad City Soviet adopted a decision to build units for pyrolyzing lids, the institute is busy developing technical-economic substantiation for the project, and there is every reason to believe in the successful realization of what was planned.

Initiative is incentive and motivation to begin the work. The Leningraders produced the initiative. Whether their know-how is widely used also depends on the initiative of people who do not wait for instructions "from above" but take the new work and the responsibility it entails on themselves.

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